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RUNNING THE RISKS.

THE PSYCHOSOCIAL PROCESSES ASSOCIATED WITH MODERATE TO SEVERE ATHLETIC INJURIES

BY

JEREMY MARTIN CAMERON ROSE

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

IN

COUNSELLING PSYCHOLOGY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

SPRING 1991

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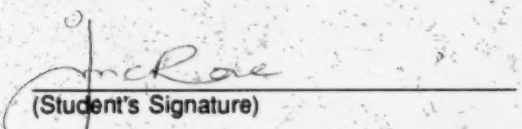

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Dedication

This work is dedicated to my mother, P. Z. A. Rose (1926-1979),

my father, A. M. T. Rose, M. C., M.A., LL. B. (1918-1987), my brother Major A. C. C. Rose (L.I.),

and the rest of my immediate family.

Just remember: *"That which does not kill me makes me stronger"* - Nietzsche.

(cited by Victor Frankl in *Man's Search for Meaning.*
New York: Washington Square Press)

Abstract

Traditionally the focus of research and intervention in the area of athletic injury has been in the physical domain. More recently however, health professionals are becoming more aware of the need to understand the psychosocial aspects of sports injury. More specifically, there appears to be a paucity of research on the experience of having an athletic injury and the process of recovery from such injuries. This research project was designed to address these gaps in the literature. Using Grounded Theory methodology, seven injured athletes were interviewed about their experience of being injured. This interview data then formed the basis for developing the theory. In addition research notes from the author's own experience of injury, observation of injured athletes, and informal interviews with athletes and health professional were used as data. In order to increase the validity of the theory an initial draft of the theory was given to athletes, sport psychologists, and sports medicine professionals for their feedback. A four stage model emerged from the data. These stages were 1) *Getting Injured*, 2) *Acknowledging the Injury*, 3) *Dealing with the Impact of the Injury*, 4) *Achieving a Physical and Psychosocial Outcome*. Two additional categories associated with the model were: *Ignoring the Lessons* (relapsing), and *Acting on the Lessons* (attempting to prevent injury). Two Basic Psychosocial Processes (BPPs) which characterized each stage of the process were: *Running the Risks* and *Opening to the Messages*. The model was compared with other models of adaptation to athletic and non-athletic injury, and with various aspects of the experience of other physical injuries and disabilities. Because the participants noted that they were addicted to exercise, and also denied their injuries, the results were also discussed with respect to exercise addiction and the denial of physical injury. The present study can contribute significantly to health professional's understanding of the psychosocial aspects of athletic injury by the delineation of the model and the in-depth description of the process. Applications of the data from this study include the education of athletes, coaches, health professionals and family members as to the psychosocial aspects of injury including the prevention of injury, and the adaptation to the psychosocial consequences of

injury. For example, psychologists should ascertain the meaning that an injury has for an athlete, in order to fully understand the implications that the injury has for the athlete. A number of future research questions are discussed.

Acknowledgements

or "I'd like to thank the academy...."

or "No man is an Island".

Firstly, I would like to thank the people who participated in this study. The injured athletes who gave up significant amounts of their time to tell their stories, and read my interpretations of them. Also the physicians, physiotherapists, psychologists, coaches and athletes who spent their time completing the validation questionnaire. Also a big thank you to the staff of the Glen Sather Clinic. In particular, thanks go to Mary Young and Bob Dunlop for aiding in the recruitment of participants, acting as sounding boards for my ideas, and helping to heal my injuries.

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Chapter One

INTRODUCTION

Background to the Study

Although many people engage in physical activity for positive health benefits, such activity is not without its risks. One of these risks is physical injury (Koplan, Powell, Sikes, Shirley, & Campbell, 1982). The increase in reported sports-related injuries (Bergandi, 1985) has lead to the development of a new sub-specialty in medicine, that of sports medicine.

Sports medicine is one of the newest specialties in the medical profession. However, although the majority of attention has traditionally been directed towards the physical well-being of athletes, a number of health care professionals, coaches, trainers and physical educators are now cognizant of the psychological factors which might be important in the rehabilitation process of injured athletes. For example, Rotella and Heyman (1986) suggested that "rehabilitation is both a mental and physical process" (p. 358), and qualified this by saying that "sports medicine has made great advances in the physical rehabilitation of injured athletes, but little attention has been given to the psychological rehabilitation of these athletes. Although some athletes have effective psychological responses, others do not" (p. 362). These sentiments have been expressed by other authors (e. g., Crossman & Jamieson, 1985; Gordon, 1986; Rotella, 1988). Thus, the purpose of this dissertation was to help to address this imbalance and investigate the psychosocial factors involved in the process of rehabilitating athletic injuries.

The Need For The Study

It has been posited that psychological factors are involved in the rehabilitation of sport injury (e. g., Rotella & Heyman, 1986); however, the literature on these factors is sparse and the data for the large part has been anecdotal or theoretical in nature. In addition, therapeutic models have been taken from non-sport injuries and superimposed onto the sports domain (Gordon, Milios & Grove, in press-a). For example, Gordon (1986), Rotella (1984, 1988), Lynch (1988), and Pederson (1986), have all noted that injured athletes may have to work through a grieving process similar to that described by Elizabeth Kubler-Ross (1969) in her book *On Death and*

Dying. However, firstly, there seems to be no systematic empirical (i. e., experimental or observed) data to support this model in athletes and, secondly, due to the demands of competitive sport, athletes may have different issues to cope with when compared to their non-athletic counterparts.

Research and literature related to psychological interventions for injured athletes is equally sparse. Rotella (1988) and other authors (e. g., Danish, 1986; Faris, 1985; Gordon, 1986) have written literature aimed at educating sport professionals as to potential strategies to enhance rehabilitation. These writings are laudable attempts at sensitizing the physician, trainer, coach, or therapist to the psychological impact of an injury on an athlete, and explain potential psychological techniques to aid rehabilitation. However, although these techniques have been taken from the mainstream of health psychology (e. g., basic communication skills, communication of empathy, teaching self-hypnosis, and other cognitive-behavioral techniques), there are few empirical studies evaluating their efficacy in the area of sports injuries (Yaffe, 1986).

Similarly, Gordon, Milios, and Grove (in press-a) have noted that from the perspective of everyday practice, physiotherapists presently do not have enough information on the psychosocial aspects of recovery in injury. For example, the chief therapist at the Glen Sather Clinic at the University of Alberta asked, "What psychological factors should physiotherapists be asking about, or be aware of, to help them determine an athlete's prognosis or readiness to return to play?" The results of this study may enhance both the athlete's and the health professional's understanding of this process. This information may make the process more manageable for the athlete and aid the health professional in helping the athlete cope with the psychosocial aspects of the injury.

In summary, more rigorous research data need to be collected in the two areas of the psychological reactions to injury and the efficacy of psychological techniques to aid rehabilitation of sport's injuries. In particular, both Nideffer (1983) and Gordon, Milios and Grove (in press-a) have called for models of the recovery process associated with sport injuries. It is towards this end that this research project was undertaken.

The Purpose of the Study

In response to the paucity of data on the psychosocial processes which may accompany sports injuries, the purpose of this study was to develop a theory grounded in data gathered from the perspective of the athlete to delineate the psychosocial processes that athletes or habitual exercisers experience as they develop and recover from moderate to severe sports injuries (i. e., injuries which require medical attention and prevent an athlete from participating in their chosen activity for at least seven days).

The main aim of this study was to describe a Basic Psychosocial Process (BPP) through which athletes pass as they experience, and attempt to recover from, injury. A BPP is defined as a change over time within an individual that occurs in at least two stages (Glaser, 1978). The BPP is a concept (or core variable) that accounts for the greatest variation in the collected data. Being a psychosocial process, a BPP will involve psychological factors within the individual (e. g., personality), and his or her interaction with their social environment (e. g., physicians, family members, teammates, coaches, or a Sports Injuries Clinic).

Since little empirical data have been derived on the psychosocial aspects of sports injury, especially from the athlete's perspective, I used a qualitative research methodology which allowed both an in-depth description of an athlete's experience of injury, and the common process that underlies this experience in a sample of athletes. The approach used was that of Grounded Theory (Glaser, 1978), since this method can be used to describe both experience and process. The research question which guided the investigation into this area was: "What (if any) psychosocial process is associated with an athletic injury?"

The Researcher's Interest in the Phenomenon of Athletic Injury

I have been involved with the sport of competitive road, track, and cross country running racing for 18 years. I am still racing competitively. As a result of my involvement with these sports, I have incurred a number of injuries over the years. Ankle sprains, patellofemoral pain (Runner's Knee), shin splints, which recurred over a period of two years, and sciatica (severe leg and buttock pain) due to pressure on the sciatic nerve from a herniated disc in the spinal column) which re-occurred

during this research project, are examples of injuries which I have faced in the past. In fact, at the time of writing, this latest injury has still not healed, and I am still undergoing interventions aimed at alleviating the problem which have included traction, anti-inflammatory medication, stretching exercises, and avoiding running, cycling, and weight training. Initially, the only activities which were allowed include walking and gentle swimming. As I write now (September, 1990), gentle jogging, swimming, and running in deep water, and a weights program designed to keep the involvement of my lower back to a minimum, have been added to the treatment regime. A chymopapain injection to decrease the size of my disc herniation has been scheduled for December, 1990.

It is important for an author to describe his or her experience with the phenomenon being studied, because the researcher is the primary instrument used in qualitative research and as such, the researcher may bias the study by his or her own experiences. One's experience with a phenomenon can also be useful. For example, Glaser and Strauss (1967) have noted that, "The researcher can get crucial insights not only during his research (and from his research), but from his own personal experience prior to, or outside it" (p. 125). I feel that my experience with injuries has given me a valuable insight into the recovery process. In order to "bracket" my biases, that is make my experience and suppositions related to this topic explicit (Quartaro, 1986), data from my own experience have been included in the results section of this dissertation.

Summary

Athletically-related injuries are becoming a more frequent health problem (Bergandi, 1985). Although attention has traditionally been focused on the physical aspects of athletic injury, researchers and practitioners are becoming increasingly aware of the psychosocial factors associated with this phenomenon. Little systematic investigation has been performed in this area, particularly with respect to the experience of the athlete. This study is an attempt to increase our understanding of this area.

In the next chapter, the literature pertaining to the psychosocial aspects of sports injuries are reviewed extensively.

Chapter Two

REVIEW OF THE LITERATURE

Psychosocial Aspects Of Sports Injury

This chapter reviews literature pertinent to psychosocial aspects of sports injury. Pertinent topics related to the psychosocial aspects of sports or athletic injuries are the prevalence of athletic injury, problems surrounding the definition of athletic injuries, psychological factors involved in predicting who gets injured, psychological responses to injury, psychological strategies used to enhance rehabilitation, and, finally, problems with the research methodology used in this field.

Prevalence Of Athletic Injury.

Recent data has indicated that athletic injuries (AI's) are a significant health problem in North America. It appears that until the late 1960s, there was little systematic collection of athletic injury data in the United States. However, public pressure, and the realization of the significant numbers of sports injuries, lead to the institution of a nationwide sports injury reporting system, known as The National Athletic Injury/Illness Reporting System (NAIRS) (Damron, Hoerner & Shaw, 1986; Martin-Levy, 1988; Rice, 1989). The NAIRS is often used in the literature for the definition of injury severity and the reporting of injury frequency. Thus, more accurate statistics are being kept on the incidence of injury, and the severity of these injuries. It was hoped that categorizing the types of athletic injuries and understanding their etiologies would result in interventions to minimize and prevent injuries (Andersen & Williams, 1988).

Damron, Hoerner and Shaw (1986) mentioned an occurrence of 50 million injuries, although no time period was specified in their report. Yaffe (1983, 1986) mentioned that 5% of admissions to accident departments in United Kingdom hospitals were due to AI's. He also mentioned that in the early 1970s two million athletic injuries were reported which prevented people from participating in sport, of whom 10% had to take time off work! A recent review (Kraus & Conroy, 1984) indicated the occurrence of 6,045 athletically/recreationally related deaths in 1978, and an estimated 3-5 million non-fatal athletic injuries each year in the United States. Although Kraus and

Conroy (1984) cautioned about the potential inaccuracies of such statistics (e. g., injuries for some sports are not reported), these figures indicate "a substantial public health problem" (p. 166).

The general consensus among professionals (e. g., Bergandi, 1985; Bramwell, Masuda, Wagner, & Holmes, 1975; Yaffe, 1983, 1986) about the incidence of athletic injuries, is that the situation is getting worse, especially as a result of the increasing numbers of exercise participants at both the competitive and recreational levels. For example, Schneider and Sussman (1986) claimed that "there are now 30 million Americans who run or jog regularly". This figure is compatible with the figures cited above from Harris (1986) and Walsh (1985).

It appears that athletically related injuries are a significant problem which may be reaching epidemic proportions, hence the title of Vinger and Hoerner's (1986) book *Sports injuries, the unthwarted epidemic.* As has already been mentioned, the statistics cited above may not be accurate for a number of reasons (see Kraus & Conroy, 1984, for a discussion). One of these reasons is that there is a great deal of controversy as to what delineates an athletic injury. This issue is discussed next.

Injury Definition

One of the problems encountered in the literature was the terminology used to define athletic injury. In fact, Noyes, Lindenfeld, and Marshall (1988) noted that, "It is seldom recognized that there is no widely used definition of what constitutes an injury" (p. 65). This has lead to problems in the epidemiological reporting of athletic injury, and in biasing research findings. It has been suggested that this one factor may be the reason why there is little agreement in research findings (Noyes et al., 1988).

One school of thought does this in terms of etiology. Thus, the terms overuse and traumatic (acute) injury have been used by Schneider and Sussman (1986) to differentiate injuries resulting from internal and external stresses, respectively. Yaffe (1983) and Lysens, Ostyn, Vanden Auweele, Lefevre, Vuylsteke, and Renson (1989) have differentiated between injuries resulting from the manner the sport is played (e. g., violence) or environmental conditions and equipment

as extrinsic, and ones resulting from individual traits or behavior (e. g., personality or physical characteristics) as intrinsic.

Gordon (1986) has also broadly classified injury based on etiology. His classifications included (a) injuries caused by interactions with the environment (e. g., poor field conditions), (b) those caused by interactions with a person or an object, and (c) self-induced injuries caused by poor skill, fatigue and psychosocial factors.

Rice (1989) has defined athletic injury as having to be the result of athletic activity. This definition, therefore, excludes injuries resulting from 'off-field' incidents (e. g., via car accident, or just 'larking about'), even though the physical and psychological sequelae may be very similar.

Another way of describing injuries is by the criteria of the loss of active participation time due to the injury (Noyes et al., 1988). In the experimental literature these definitions have ranged from "an injury or physical disability sustained during a coach-directed game or practise which causes cessation of an athlete's customary participation on the participation day following the injury" (Crossman, 1986, p. 55), to "a training related incident that prevented a subject from jogging for at least a week" (Pollock, Gettman, Milesis, Bah, Durstine, & Johnson, 1977, p. 32). The use of time loss as a criterion for injury has been criticized because the effects of the injury will depend on an individual's sport and subjective responses to the injury. Firstly, an equivalent ankle sprain might curtail a soccer player from playing, but not a cyclist, since the latter does not have to bear weight on the injured body part. Secondly, one athlete may play with an injury, but another may not due to differences in personality or pain tolerance (Noyes et al., 1988). Noyes et al. (1988) suggested that for an athletic injury to be defined as such, the following two criteria should be present (a) it keeps the player out of practice for one day following the injury, (b) the injury requires medical or dental care beyond ice or wrapping, and that this medical attention should be given by a physician or trainer.

The NAIRS system breaks down injuries into three categories based upon the time lost from participation. These are: minor (less than seven days lost), moderate (between seven and twenty-one days lost), and major (more than three weeks lost) (Rice, 1989). Some researchers

(e. g., Coddington & Troxell, 1980) ignored the minor injury category, since the NAIRS considered these to be "insignificant" (p. 4).

In this present research study, a combination of the NAIRS system and the definition of Noyes et al. (1988) is used for athletic injury. In order to investigate the psychosocial sequelae of athletic injury, I decided to investigate athletes who had incurred an injury which prevented them from participating in their chosen sport for at least seven days (moderate to severe injury according to the NAIRS system), and also required medical attention (defined as per Noyes et al., 1988), since it was expected that such injuries would elicit more psychological responses.

One problem with the broad arbitrary classification systems of injury severity, is that such classification systems ignore the impact, or meaning, that the injury has to the athlete. Similar to the effect of group data in quantitative research, collapsing injury data into large categories will generally result in the loss of the subjective experience of the injury. Crossman and Jamieson (1985) suggested that different athletes often have dissimilar perceptions of the severity of an equivalent injury such as a second-degree ankle sprain. For example, each sprained ankle is different and will probably mean something different to each athlete. Individual reactions to the same injury might range from "when can I jog again?" to "can I jog again?" (Sanderson, 1978). A qualitative approach to sports injury was chosen for this study so that the idiosyncratic and common reactions to athletic injury might be studied.

An additional problem with defining injuries based on short term definitions is that athletes may return to their sport without the injury having healed properly. Thus, a seemingly minor injury (e. g., the injured athlete was back in training in less than a week), may turn into a major chronic condition that may be overlooked, or forgotten with time.

Finally, it is interesting to note that some authors have neglected to specifically define what constitutes an athletic injury (e. g., Bergandi, 1985; Eldridge, 1983; Gordon, 1986), and this can make replication of research studies impossible.

A perusal of the literature indicates three important points. Firstly, the definition and recording of injury appears at times to have been arbitrary. This may be a reason for the equivocal results

which have been reported by some of the experimental studies cited later in this proposal. Secondly, an accurate definition of injuries would seem to be important if one wishes to investigate an athlete's reaction to any injury. One might expect a very different psychological reaction to a major injury (e. g., a broken leg) as compared to a blister! Lastly, numerical coding, or labelling of athletic injuries will not take into account the meaning the injury has to the athlete. This information can only be gleaned by interviewing the athlete him/herself, and this data can be collected best by using qualitative research techniques.

Research of psychological factors involved in the prediction of and predisposition to injury

Much of the early literature in this area has focussed on trying to identify the physical and psychological factors, or traits, that might predispose an athlete to injury. Psychological factors have included injury proneness, the effects of life-stresses, personality variables and attentional factors. This area has been reviewed by many authors including Andersen and Williams (1988), Bergandi (1985), Crossman, (1985, 1986), Kerr and Fowler (1988), Rotella and Heyman, (1986), and Rotella (1988).

Injury Proneness

Based on his clinical and coaching experience, Sanderson (1977, cited in Bergandi, 1985; Yaffe, 1983, 1986) coined the term *injury-prone athlete*. Thus, an athlete may fake injury, complain of an injury without any apparent pathology, or even have an injury as a result of pre-existing psychological conflicts. For example a child might 'get injured' and use this to punish a parent who is forcing him/her to participate. However, this personal observation has not been corroborated experimentally. For example, Jackson, Jarrett, Bailey, Kausek, Swanson, and Powell (1978) did not find any consistent personality traits in injury-prone football players (i. e., those sustaining multiple injuries).

Recently, however, Lysens et al. (1989) reported on a year long prospective study of accidental injury-prone and overuse injury-prone profiles of young athletes (mean age 18 years). Their findings indicated that "psychological and psychosocial characteristics can be clearly and

reasonably related to acute injuries, while the overuse injury profile is mainly based on physical traits" (p. 618). More specifically, the more "accident prone" individuals demonstrated similar characteristics of accident repeaters in industrial and car accidents. These characteristics include a lack of caution, and low state and trait anxiety which can result in high risk-taking behavior. Interestingly enough they also cite theories (e. g., Nideffer, 1983) which suggest that high state anxiety might reduce an athlete's concentration and result in injury; this factor is discussed in more detail below. These authors cautioned that predictions of injury from personality data are not infallible and should be seen in the context of an individual's life events and the state of their coping mechanisms. It should also be noted that the Lysens et al. (1989) study was conducted with first year university physical education students, and may not be generalizable to other populations.

Thus, there is a paucity of empirical research evidence to support the "injury-prone" athlete. However, most research in the area of the psychology of sports injuries has focused on the next topic to be discussed, that of Life Event Stress (LES).

Life event stress (LES)

Life Event Stress (LES) is perhaps the most thoroughly researched area in the field of psychological factors which relate to sports injury. This line of research was prompted by findings in the 1960s and 1970s (e. g., Holmes & Rahe, 1967) that the onset of illness is associated with the occurrence of major life events, measured by the Social Readjustment Rating Scale (SRSS, also known as the Schedule of Recent Experience [SRE]) in the preceding one or two years. The more life changes or life events (e. g., marriage break up, physical injury, job loss, or death of a spouse), the more likely some people were to contract illness. Researchers began to wonder if such a relationship might be true for life changes and likelihood of getting injured in a sports related context.

Bramwell, Masuda, Wagner, and Holmes (1975) adapted the Holmes and Rahe scale (the SRSS/SRE) for an athletic population and created the Social and Athletic Readjustment Rating Scale (SARRS). No reliability or validity data were provided for the SARRS. Using the SARRS,

Bramwell et al. investigated the relationship between life changes in the previous one and two year periods and injury in the college football season. They concluded that "the risk of injury to a football player increases in direct relationship to the accumulation of the challenging life-events under study" (p. 17). They hypothesized that inattention to task specific cues may result from the psychophysiological arousal associated with life-stress, thus rendering the athlete more vulnerable to injury-producing situations in football. It should be noted however, that the SRSS/SRE has been criticized on the grounds of test construction (Day, 1988), and reliability and validity (Katschnig, 1986a; Stone, 1989). In summary, Katschnig (1986b) noted that the such life event inventories as the "SRE seriously distort the representation of people's life experiences and should no longer be used" (p. 248). Therefore, the results of research studies in the prediction of athletic injuries from Life Event Stress which have used inventories (e. g., the SARRS) derived from the SRRS, which are cited below, should be interpreted with caution.

Coddington and Troxell (1980) used the Life Event Scale for Adolescents (LES-A) (Coddington, 1972a) in a prospective-type study to investigate the effect of emotional factors on football injury rates. Thus, although players were asked to remember their past life events at the beginning of the season, the life event data was still collected retrospectively. The LES-A was developed from the SARRS, and the LES-A has also been criticized with respect to its reliability and validity (Andersen, 1984). Out of the 748 adolescents sampled, they found 114 high school football players, of whom 23 fit the criteria for moderate to severe injuries as defined by the NAIRS system. These authors concluded that high school football players who experienced higher scores on actual loss (e. g., parental divorce or death) or familial life events, were more likely to sustain a significant injury. Although no explanation of the results was provided, the authors recommended coping skills training or group support as interventions for athletes in these two high risk categories.

Again, using college football players and the SARRS and the NAIRS system, Cryan and Alles (1983) noted that players who had higher life change scores in the previous year had a greater chance of getting injured, and sustaining multiple injuries. However, there was no significant

difference in injury severity between high, medium and low life-stress groups. As in Coddington and Troxell's (1980) report, no mechanism was suggested by Cryan and Alles to explain their results.

Other researchers have not found such a strong relationship between life-stress events and injury in American football. Passer and Seese (1983) studied 104 collegiate varsity football players to investigate the relationship between positive and negative life change events and athletic injury. They also investigated the effects of locus of control, trait anxiety, and competitive trait anxiety as moderating variables in this relationship. The Life Experiences Survey (LES) (Mueller, Edwards, & Yarvis, 1977), originally adapted from the SRE, was adapted by Passer and Seese for the athletic population and called ALES - the Athletic LES. The ALES was then used as the measure of life change in Passer and Seese's study. No reliability or validity data have been reported by Mueller et al. for their LES, or for Passe and Seese's ALES measure. Time lost from participation was the measure of injury. National Collegiate Athletic Association (NCAA) division 1 and 2 teams were surveyed. The results of this study were equivocal. There was no significant correlation between time loss due to injury, and positive or negative life changes. However, once the athletes were grouped into injured and non-injured groups some effects were noted. No significant effects were found in relation to the moderating variables, and although injured members of the division 2 team tended to have more negatively perceived life events, this relationship was not found in the division 1 team. Injured players tended to have higher object loss scores than non-injured players. These equivocal results were not explained, and this study has often been misquoted as adding to the 'conclusive' evidence for the life events-athletic injury relationship, an assumption not supported by the data. Passer and Seese (1983) admitted that the consistency of data across Bramwell et al. (1975), Coddington and Troxell (1980), and their own study "is not impressive" (p. 15).

Given that there is some evidence supporting life stress and injury in football, is there any evidence supporting this relationship in other sports? Williams, Tonyman, and Wadsworth (1986) used the SARRS, ALES, and NAIRS to investigate the life stress-injury relationship in 179 NCAA

division 1 male and female volleyball players. Williams et al. did not find any evidence to support the LES/injury relationship shown in some studies of football players. One reason for these findings may be the low stress scores shown by the volleyball players in their study. A second explanation may be the different attentional characteristics of the two games. Football may require a broad external focus, volleyball a narrow internal focus. However, this explanation was speculative, and the connection between different attentional requirements of these sports and injury was not well developed. However, Williams et al. (1986) did find that non-injured athletes tended to have better coping resources, which mostly revolved around the resource of social support (Andersen & Williams, 1988). The relationship between social support and injuries has also been supported by Hardy, Prentice, Kirsanoff, Richman, and Rosenfeld (cited in Anderson & Williams, 1988). These authors found that athletes who reported low social support were more likely to be injured than those athletes with high social support, irrespective of life stress levels.

Lysens, Vanden Auweele, and Ostyn (1986) examined the life change-injury relationship in 99 first year physical education students. Lysens et al. used another life events measure, the Life Events Questionnaire (LEQ), which was 'inspired' by the SARRS (p. 78). The scale was developed from the experiences of physical education students, and Lysens et al. claimed that the LEQ demonstrated satisfactory construct validity, although no reliability data were presented. Lysens et al. found a low but 'significant' relationship ($p < 0.09$) between life stress and acute injuries. Lysens et al. interpreted these results as suggesting that those students who showed a high level of life change were at greater risk of sustaining acute injuries. This relationship was not found with overuse injuries. These authors concluded that their results were in accordance with the previous hypothetical explanation of the life stress-injury relationship by Bramwell et al. (1975). Lysens et al. (1986) did, however, note that psychosocial factors play a "limited role in the genesis of acute injuries" (p. 83), and rightly cautioned that the life stress-injury relationship should also take into account the individual's stress-coping resources and their interpretation of life stressors.

Most recently, Smith, Smoll, and Ptacek (1990) investigated the role of conjunctive moderator variables on the relationship between life stress as measured by a modified version of the Adolescent Perceived Events Scale - APES (Compas, Davis, Forsythe, & Wagner, 1987), and injury in high school athletes engaging in boys and girls basketball, boys wrestling, and girls gymnastics. The APES is reported to have good reliability and adequate concurrent validity (Compas et al., 1987). Conjunctive moderator variables are those that "must co-occur in a specific combination or pattern, in order to maximize the relation between a predictor and an outcome variable" (Smith, Smoll, & Ptacek, 1990, p. 360). These variables are different from Disjunctive moderator variables of which "any one of a number of moderators maximizes the predictor-criterion relationship" (p. 360). These authors examined social support (e. g., the perceived availability of help and guidance from parents, coaches, religious groups) and psychological coping skills as measured by the Athletic Coping Skills Inventory (Smith, Smoll, & Schutz, 1988, cited in Smith, Smoll, & Ptacek, 1990) as the moderator variables between life-stress and injury. The results of Smith, Smoll, and Ptacek's (1990) research indicated that psychological coping skills and social support interacted in a conjunctive manner, such that athletes who were low in both coping skills and social support, were more vulnerable to injury. In addition, negative life events accounted for 22-30% of the injury variance. These results suggest the need for future research in this area to be of a multivariate nature, and that the patterns of interaction of different variables are as (if not more) important than if the variables are analyzed in isolation. Additionally, the findings of Smith, Smoll, and Ptacek (1990) also highlighted the importance of coping skills and social support for the prevention of injury in young athletes. These factors might mediate the impact of negative life-events by decreasing their threat value (high social support), by helping to accurately interpret the events, and by controlling arousal levels (psychological coping skills). These variables might then moderate the attentional and performance deficits that have been suggested to mediate the stress-injury relationship.

Kerr and Minden (1988) investigated the relationship between stressful life events and athletic injury in 41 elite female gymnasts using the Coddington Life Event Record (Coddington, 1972b).

Although like Passer and Seese (1983), they did not find any relationship between the moderator variables of trait anxiety and locus of control; they did discover a significant relationship between stressful life events and injury. Thus, gymnasts experiencing the greatest number of stressful life events demonstrated the greatest number and severity of injuries. Kerr and Minden postulated that concentrating on inappropriate events (e. g., "Thinking of other things") as a result of stress may result in performance decrements and an increased chance of injury. Interestingly enough, these authors noted that an increased rate of injury occurred just before competition. Reasons for this may include increased training intensity before a big championship, or perhaps heightened pre-competition anxiety or stress. The authors suggested that these suppositions should be tested using longitudinal designs, since their research design was retrospective.

In summary, the research on life stress, or life events and injury, has mainly focused on college football players, and has produced equivocal results despite some reviewing authors' tendency to selectively attend to the significant positive relationships between stress and injury, instead of accurately reporting the contrary evidence (e. g., Andersen & Williams, 1988; Kerr & Minden, 1988). The simplistic approach to the interpretation of results is also reflected in the narrow scope of many research studies which do not take into account the complex interaction of the many variables involved in the life stress-injury relationship (Anderson & Williams, 1988). For example, from the data cited above, it appears that in order to increase our understanding of the life stress-injury relationship, future research should take into account the role and pattern of moderator variables such as coping resources (e. g., Smith, Smoll, & Ptacek, 1990). Other moderator variables that may be important to study include the predictability of the life event, the psychological hardiness of the athlete, and perhaps the effect of minor daily hassles in producing life stress (Kerr & Fowler, 1988). In addition, the life stress relationship should be studied in a number of different sports (Williams, Tonyman, & Wadsworth, 1986).

A further problem with the life event stress area, is that often the meaning of the life event to the individual is ignored (i. e., life events are scored the same for each individual) (Day, 1988). In addition, in the past the processes mediating the LES/injury relationship have not been

adequately theorized or explained (Anderson & Williams, 1988). For example, how is it that athletes in the low life stress groups are also getting injured, or that high-stress athletes are not getting injured? Again, perhaps group-related data have lost the significance of the event to the individual, and resulted in the equivocal results found.

Another reason for the contradictory results found in past studies may be the use of many different life-event scales (APES, SARRS, ALES, LEQ, LES-A, LES) some of which have questionable reliability and validity. Thus, the results of such studies should be interpreted with caution. Although the validity of paper and pencil Life Stress questionnaires is difficult to establish (Stone, 1989), reliability may not be very relevant in a dynamic area such as life events. Standardization of such scales used for this research may result in more conclusive results, and allow comparison across studies. Also, in relation to instrumentation, Andersen and Williams (1988), Crossman (1986), and Kerr and Minden (1988) are among many researchers who have called for more sport-specific instruments to be used in this area of research (e. g., an athletically related locus of control instrument). Other authors (e. g., Katschnig, 1986b) have indicated that life event research should involve the use of structured interviews as opposed to self-report instruments, since the former can take into account the meaning of, and effect of, the life event to the individual.

It appears that the trend in prospective research should be continued (Kerr & Fowler, 1988) since retrospective data (e. g., Kerr & Minden, 1988) may confound results. Biased recall and retrospective contamination (exaggerating the importance of past events) are possible sources of error variance here (Kerr & Fowler, 1988). This form of error variance may be unavoidable when using questionnaires such as the LES which require the retrospective recall of events over the previous two years. Additionally, if LES questionnaires are completed at the end of the season, they will include the actual stressful event of the injury in the data scores used to predict the injury (see Day, 1988). For example, one research study (Lysens et al.,1986) was described as prospective in nature, although the actual procedures appeared to be retrospective. In other words, the subjects completed an inventory (which included athletic injury as a life-event stressor)

retrospectively, at the end of a year in which their injuries were recorded. This behooves researchers to be clear as to their definitions of prospective and retrospective designs.

A further methodological flaw in the life stress-injury research is that the physical dangers to which each sports participant will be exposed to in one season is different. Thus, such differences in 'injury opportunity' will certainly confound research findings. Kerr and Fowler (1988) have suggested that future research may wish to try to hold injury opportunity as a constant. However, this seems to be an impossible ideal.

More recently, Andersen and Williams (1988) have called for more theory development and refinement of methodology in this area. These authors have developed a theoretical model of stress and athletic injuries adapted from other models of athletic stress and illness or injury (e. g., Smith, 1984). This model acknowledges the interaction of potential athletic stressors, history of stressors (e. g., major life events, daily hassles, and previous injury), the athlete's cognitive appraisal of those stressors (e. g., perhaps related to irrational beliefs), personality factors (e. g., locus of control and hardiness), coping resources (e. g., general coping behaviors such as sleep and nutrition, and specific coping mechanisms such as social support, or drugs), physiological and attentional responses to the stressor (e. g., attentional narrowing and muscle tension), and the potential outcome of athletic injury. This model is a laudable attempt to integrate prior psychological knowledge, and should be a useful guide for future research and interventions (e. g., cognitive restructuring and relaxation training) aimed at reducing the stress response and subsequent injury risk. Such a model can also be adapted to an athlete's response to the stress of injury and the rehabilitation process.

The area of life-stress and athletic injury appears complex, presently equivocal and ripe for further research. Another variable that has been researched in an attempt to predict injury is that of an athlete's personality.

Personality Variables

Historically, there have been some data suggesting that personality and psychological state factors have been associated with industrial and automobile accidents. Research has been

carried out to see if this trend is applicable to the area of sports injuries (Kerr & Fowler, 1988). Such factors include psychological traits (e. g., trait anxiety, locus of control, self-concept, visual perception, motivational styles) and their interaction with state phenomena such as attentional styles and strategies.

Trait personality, and self-concept.

Personality traits. Some researchers have attempted to correlate injury occurrence and scores on standard personality tests such as the California Personality Inventory (CPI) and Cattel's 16 Personality Factors (16-PF). For example, Govern and Koppenhaver (1965, cited in Young & Cohen, 1978) found that they could not predict the occurrence of athletic injuries in football players from personality data. Kraus (1967, cited in Young & Cohen, 1981) also found no significant association between injury experience and personality traits in intramural football players. In a prospective study, Brown (1971) used the California Psychological Inventory (CPI) and found no significant relationships between personality traits and football injuries. However, Irvin (1975) found that injured vs. non-injured high school football players could be discriminated on the basis of Factor A (Reserved vs. Outgoing) using Cattel's Sixteen Personality Factor Inventory (16-PF), although the direction of this difference was not reported. The nature of Irvin's design, whether prospective or retrospective was not reported. Valliant (1981), using the 16-PF, found that injured runners were less toughminded and less forthright than their non-injured counterparts. However, these data were collected retrospectively and included a vague definition of injury which was, "physiological damage or bodily pain which interfered with one's ability to run" (p. 252). In addition, Valliant's injured runners also were heavier, taller, and ran more miles per week than non-injured runner. These data indicated the need for multivariate designs if the relative contribution of psychosocial and physical factors to injury is to be understood.

Jackson et al. (1978), using a prospective design with the 16-PF on 110 high school football players, found that on factor A (reserved vs. outgoing), more reserved athletes reported the most severe injuries. Additionally, on factor I (tough-minded vs. tender-minded), they found that more tender minded individuals were more likely to be injured. This latter finding supported Valliant's

(1981) data, cited above. One explanation was that more tender minded players seek out medical care. Thus, the results may be an artifact of injury reporting rather than actual injury (Jackson et al., 1978).

Although Jackson et al. accepted that our ability to predict injuries from personality data is not yet well developed, other authors have not been as cautious. For example, Kulund (1988) stated that "personality factors have been found to correlate well with injury rates and severity" (p. 18). This statement was only based on the data from Jackson et al. (1978).

Self-concept. Some authors have examined the relationship between self-concept and athletic injuries. Self-concept refers to a global perception of the self, and may include such factors as personal identity, feelings about oneself, and what one actually does (actions) (e. g., see Young & Cohen, 1979, 1981).

Young and Cohen (1979, 1981) investigated the relationship between self-concept (in its various facets) and athletic injury. In 1979 they published the results of a study using female collegiate basketball players as the subjects. Utilizing the Tennessee Self-Concept scale, they statistically tested the differences on various self-concept scores between players who became injured during two tournaments, and those that did not. No significant results were found. However, in a second study using a similar approach, but this time with high-school basketball players, Young and Cohen (1981) found that injured players had higher overall self-concept scores and more positive views of their health, appearance, skills and personal worth. The injured players were also less open to criticism. The difference in the results of the two studies may have stemmed from the different sample sizes, or educational level of these young women. The authors concluded that injured players might take more risks and find themselves in more injury-prone situations. This idea has been supported by recent evidence from Kerr and Minden (1988) who noted a trend towards a significant relationship between higher self-concept scores on the Coopersmith Self-Esteem Inventory, and greater injury occurrence.

Thus, although the evidence is equivocal, there is some support for the relationship between self-concept and injury. However, the mechanisms underlying this relationship still remain

speculative. One mechanism of both life-stress and personality effects on athletic injury may be via the anxiety, arousal, and attentional changes resulting from the athlete perceiving a particular situation (or series of life events) as being threatening. These changes may then result in this athlete becoming vulnerable to an injury-producing event by incorrectly processing task-relevant cues (Bramwell et al., 1975) (e. g., mistiming a tackle). These factors are reviewed next.

Anxiety, Perception and Attention

Trait anxiety. Anxiety, attention and perceptual variables have been suggested as mechanisms mediating between situational factors and the occurrence of athletic injury. For example, Reilly (1975, cited in Yaffe, 1986) suggested that trait anxious athletes might be more prone to injury due to their hesitation on the field of play. Trait anxiety refers to a person's tendency to perceive situations as anxiety provoking and to respond to them with anxiety (Kerr & Minden, 1988). Reilly found a positive correlation between apprehensiveness and number of joint injuries. However, since this reference is currently unavailable, Reilly's methodology is unclear. For example, if the anxiety scores were elicited after an injury, then the anxiety/apprehensiveness associated with being injured may have confounded the results. More recently, Lysens et al. (1989) noted that athletes incurring sports accidents demonstrated a lack of caution, and low state and trait anxiety, which results in high risk taking behavior. This suggests a single mechanism for the relationship of anxiety and injury.

Other researchers have not found a significant role of anxiety in injury. For example, Passer and Seese's (1983) results showed that neither trait anxiety nor competitive trait anxiety (a sport related anxiety scale) consistently moderated the effects of the life stress-injury relationship. Similarly, Kerr and Minden (1988) found no significant relationship between trait anxiety and injury.

Nideffer (1981, 1983) posited another mechanism underlying the anxiety-injury relationship. First, as athletes become anxious their attentional focus may become narrowed, and, thus they might not attend to performance related cues and predispose themselves to injury. Secondly, the muscle tension associated with arousal may make athletes more vulnerable to musculoskeletal

injury due to decreases in flexibility. Although this theory is congruent with current theory on anxiety-performance relationships (Landers, 1980), it does not appear to have been formally investigated until recently. For example, Bond, Miller and Chrisfield (1988) investigated the relationship between injury and scores on Nideffer's (1976) Test of Attentional and Interpersonal Style (TAIS) a reliable and reasonably valid instrument. These authors posited that a swimmer employing effective attentional strategies (e. g., analyzing and integrating information from a variety of sources, making few errors and having good attentional flexibility) would be less likely to become injured since the swimmer would be able to monitor bodily cues related to injury. However, the opposite was found. Athletes with good attentional strategies incurred more injuries. In addition, the female swimmers, who had more injuries, also scored higher on a scale measuring enjoyment in sports competition and participation, although these results may have been confounded by the small sample size (N=14). The authors were at a loss to adequately explain the results, and concluded that the study should be replicated with a larger sample; they also questioned the validity of using the TAIS in such research. Thus, as in most research in this area, results remain equivocal and the hypothesized mechanisms lack empirical support.

In regards to the attention-injury hypothesis, other theories apart from anxiety and attention have been suggested. For example, Morgan (1978) and Morgan and Pollock (1977) found that marathon runners voluntarily employed cognitive strategies of either <u>associating</u> (attending to bodily cues of discomfort), <u>dissociating</u> (focussing attention on other things such as solving problems, or mental imagery) or cycles using both strategies (for a review of these types of strategies see Rose, 1986). Morgan and Pollock (1977) cautioned that dissociative strategies might result in injury if signals from the body were ignored.

This hypothesis has been tested by two retrospective survey studies involving marathon runners. Firstly, McKelvie, Valliant and Asu (1985) predicted that runners who denied or <u>repressed</u> threatening signals from the body (dissociation) would more likely to get injured than those who were more <u>sensitized</u> to their body (association). However, this hypothesis was not supported by the data. Similarly, Masters and Lambert's (1989) studied the relationship between

perceived levels of dissociation and association in a race and injuries incurred on previous runs and during the race itself. The authors concluded that dissociation was not related to injury. However, they did not suggest the corollary of their results; that is, association might be related to non-injury since the majority of the runners demonstrated cognitions and feelings akin to association, and did not become injured in the race!

The relationship of cognitive strategies to injury has yet to be supported and current results may be an artifact of retrospective research design, the difficulty of measuring altered states such as dissociation, and the inability to imply causality from correlational research (e. g., Masters & Lambert, 1989). Thus, the mechanisms underlying such relationships are difficult to verify.

Visual perception. The role of visual-perceptual factors in injury occurrence has been investigated by Pargman (1976) and Dalhauser and Thomas (1979). Pargman (1976) investigated the relationship between visual disembedding (defined as "the ability to isolate from an organized visual field a part as separate from its surroundings" (p. 762)), and injury in college football players. Pargman's results showed that a higher mean score on a visual disembedding tests was associated with uninjured athletes, and that injured athletes tended to have lower scores. Similarly, Dalhauser and Thomas (1979) noted that football players who incurred fewer injuries had field-independent visual perception when compared to their injured cohorts. This information suggests that an individual's ability to pick out cues from a background may help them avoid injurious situations.

Locus of control. Rotter's (1972) concept of locus of control refers to a tendency for people to believe their world is controlled by external factors such as luck or powerful others, or internal factors such as self-control and responsibility (Kerr & Minden, 1988). Some authors have attempted to establish the relationship between this variable and sports injuries.

Dahlhauser and Thomas (1979) found that athletes who scored higher on tests of general and football-related locus of control incurred fewer injuries. The nature of the design (e. g., whether retrospective or prospective) was not reported in their paper. However, other authors (e. g., Passer & Seese, 1983) found no effect of locus of control as a moderating variable between life

change stress and injury. Kerr and Minden (1988) found no significant relationships between measures of locus of control and injury. McKelvie et al. (1985) also did not find any significant relationship between locus of control and injury, even though they expected that more internally oriented individuals would have fewer injuries since these individuals are typically more concerned with their health and avoid risk-taking. Thus, there seem to be no consistent data either supporting or refuting the injury-locus of control hypothesis.

Motivational characteristics. Diekhoff (1984), using a questionnaire approach, investigated the relationship between compulsivity (defined here as 'Type-A' behavior) and athletic injury in runners. People demonstrating Type-A behavior typically react to challenges with time urgency, hostility, and physiological arousal (e. g., increases heart rate, and blood pressure). Diekhoff's results indicated that compulsive runners reported a greater number of injuries in comparison to their non-compulsive counterparts. What mechanism might underlie this relationship? Although the injured runners tended to run more miles (similar to Valliant's (1981) findings) and race more, compulsivity and training explained little of the common variance. Diekhoff (1984) then hypothesized that type-A runners may feel rushed at times of challenge and neglect to warm-up, or demonstrate chronic muscle tension leading to muscle strains. This provides support to the contention by Williams et al. (1986) that different mechanisms might mediate the psychosocial factors-injury relationship in different sports. Thus, the etiological processes between contact sport (extrinsic) and running (overuse) injuries may be different. However, Deikhoff's (1984) data did not include type of injury, and so this speculation cannot be tested. In addition, the retrospective nature of Diekhoff's methodology is also a limitation of the study (e. g., problems of trying to remember injuries, doctors visits etc.). Indeed, Diekhoff also noted that the injury itself might affect people's answers to the personality tests, and thus confounded results. Finally, Diekhoff did not include anthropometric data (e. g., height and weight) in his analysis, even though these have previously been found to be predictive of injury (Valliant, 1981).

More recently, McClay, Appleby, and Plascak (1989) investigated the relationship between self motivation and injury in young cross country runners (ages 14-18). Self motivation was measured

by the Self Motivation Inventory (SMI), a reliable and valid instrument for this purpose (Dishman, Ickes, & Morgan, 1980). McClay et al. hypothesized that highly motivated athletes who live by the axioms "No pain, no gain", or "when the going gets tough, the tough get going", might ignore the body's cues of pain (fatigue and pain), of impending injury and end up getting injured. Their results supported this hypothesis, and indicated that the SMI was a good indicator of injury, especially in young female cross country runners who incurred serious injuries (e. g., stress fractures), which were often season ending.

Another recent study involved professional ballet dancers (Hamilton, Hamilton, Meltzer, Marshall, & Molnar, 1989). This study indicated a relationship between achievement motivation and injury. Dancers who experienced the greatest number of injuries (particularly overuse injuries such as stress fractures) exhibited an overachieving profile (e. g., dominant, assertive, extraverted and enterprising) when measured on the Adult Personality Inventory (API). Another interesting finding was that amenorrheic dancers suffered more stress fractures. In sum, Hamilton et al. suggested that these results might indicate that the training and nutritional practices of dancers chasing the perfect body type, coupled with the high level of performance characteristic of this profession, may result in injury. This may be especially true of those dancers who do not respect the physical limitations of their bodies. Again, these results must be interpreted with some caution due to the small sample size used (N=29) and the retrospective nature of the design.

Although these three studies were carried out with small sample sizes, they have indicated a mechanism for the psychology-injury relationship. Thus, individuals described as hard-driving, compulsive or highly self-motivated may push their bodies too far and this may be particularly true in activities where physical fitness is a premium requirement for high performance.

Summary of Predicting Athletic Injury from Personality

In general, the attempts to link certain personality variables to sports injury have failed (Kerr & Fowler, 1988). For example, research using personality questionnaires (e. g., CPI and 16-PF), measures of self-concept, locus of control, and trait anxiety have yielded equivocal results, as have the studies on attentional style and strategies. The results of studies of visual perception

and motivational characteristics have been more promising, yet need further replication with other sports. Future research should include larger sample sizes and multivariate, prospective designs. Retrospective designs, such as evaluating personality or life-stress variables at the end of a season should be avoided since the stress of an athletic injury incurred during the season itself might contaminate the results. In the future pre-and post- season evaluations of personality or life stress might be done to further assess the impact of an injury.

Summary of Prediction of Athletic Injury From Psychosocial Variables

Although some research has been done in attempting to predict injury 'predisposed' athletes from a psychological perspective, this research has focussed mainly on one sport (football) and one area (life event stress). Although other areas have been investigated, results in all the areas appear to be equivocal (e. g., injury rates in these studies have ranged from 16.2% to 30% of the samples used [Coddington & Troxell, 1980]), limited in generalizability, have used small sample sizes (Crossman, 1986), and have been generated from predominantly *ex post facto* research designs. For example, it should be noted that conclusions based on *ex post facto* designs (e. g., Bramwell et al., 1975; Coddington & Troxell, 1980) should be interpreted with caution. Common criticisms of such research include lack of control of independent variables, and subsequent improper interpretation of results (Kerlinger, 1973). This caution appears to apply to most of the investigations reported in this area. In addition, these studies do not seem to be connected by any ongoing theoretical direction. Likewise, empirical data related to the process of the psychological mechanisms and replication studies are lacking at present.

Psychological Reactions to Injury

The second major area of research in the field of psychology and sports injury is that of an athlete's psychological responses or reactions to injury.

How do athletes react to an injury? This area has not been well researched, and is mainly supported by anecdotal data and theoretical literature. Writers in this area have focussed on the athletic participant's cognitive, affective, and behavioral reactions to an injury, or the cessation of exercise. In this section, the areas that are discussed include: a) the psychosocial process of

adapting to an injury; b) emotional, and cognitive responses to injury; c) existential and developmental issues; d) factors relating to the athletes response to injury; e) positive and negative responses to injury; and f) a comparison of athlete's and non-athlete's responses to injury. The behavioral sequelae to injury are described within each of these sections.

The Adaptation Process

Many authors have discussed the notion that, after an injury, athletes may follow the stages of grieving similar to the loss of a loved one (e. g., Gordon 1986; Lynch, 1988; Musielewicz, 1989; Pedersen, 1986; Rotella, 1984, 1988; Rotella & Heyman, 1986; Weiss & Troxel, 1986). Although there are many models, two appear in the athletic injury literature. The first, a model adapted from Kubler-Ross (1969), consists of five stages: (a) Denial of the injury; (b) Anger at oneself, the injury, the cause of the injury or health professionals who do not seem to help; (c) Bargaining with oneself and the health professional; (d) Depression, feeling down, sad, hopeless or helpless; and (e) Acceptance/Resignation of the injury and the need to take responsibility for healing (see Table 1 for examples of statements exemplifying each of these stages). Secondly, a three stage model (noted in Pedersen, 1986) might include (a) Shock and Denial of the injury; (b) Preoccupation with the injury and attempts to explore its meaning, bargaining is demonstrated; and (c) Reorganization, where the athlete reconnects with his or her normal routine, and accepts the injury. Both of these models appear to have common themes of: (1) denial of the injury; (2) bargaining with oneself, God, or therapist; and (3) acceptance of the injury.

Gordon (1986) noted that athletes respond to injury in different ways and these stages of response may not be progressive or sequential. Similarly, Faris (1985) and Pedersen (1986) noted that the sequence of emotional events is not predictable and indeed, may be cyclical. However, the general notion is that the sooner the athlete moves from the Denial stage to the Acceptance stage in the Kubler-Ross model, the better.

In the response to athletic injury, denial is a consistent theme in the anecdotal and narrative type of publications written for the medical profession (e. g., Faris, 1985; Morgan, 1979; Musielewicz, 1989; Nideffer, 1981, 1983; Rotella & Heyman, 1986; Yaffe, 1983, 1986). Rotella

and Heyman (1986) suggested that one reason for the presence of such denial in injured athletes was the presence of dysfunctional attitudes such as "Act tough and always give 110%" (p. 349), and an athlete's need to impress others and "project a false image of invulnerability" (p. 350). Thus, in a way, these athletes fall into the trap of the "Utopia syndrome" (Watzlawick, Weakland,& Fisch (1974)) and, in attempting to live up to an unrealistic ideal, they end up hurting themselves. Interestingly enough, these attitudes can pervade into therapy. For example, Gordon, Milios, and Grove (in press-a) indicated that some physiotherapists thought that athletes who overdid therapy (a kind of "more is better", "I'm tough" attitude) were really denying the seriousness of the injury.

Although Gordon (1986) and Musielewicz (1989) have given some good examples of the possible 'self-talk' typifying each stage (see Table 1), this model does not seem to have been well tested empirically. Data supporting the 'grief-response' model have, however, been reported in the literature. Weiss and Troxel (1986) interviewed ten injured athletes and found evidence for disbelief, fear, rage, and depression once the athlete realized he or she was injured. In addition, these authors found that athletes said that they engaged in physical activities (e. g., skipping rehabilitation commitments or vigorous hiking) that may have negatively affected the healing process as a way of coping with the feelings of being overwhelmed by their activity restrictions. These behaviors appear akin to bargaining behavior. Gordon et al. (in press-a, in press-b) surveyed sport physiotherapists and noted bargaining, denial, anger and depression in injured athletes. Although these responses were thought to be a 'poor response to injury' (Gordon et al., in press a, p. 2), bargaining and denial were reported more frequently than anger and depression. Further behaviors that can be taken as evidence for denial were cited by Kent (1982) who noted that in a sample of 450 amateur athletes at a Toronto sports medicine clinic, over half waited five days or longer before seeking treatment. Factors that might be related to this delay might include: (a) the personality of the athletes, who disregarded the risks of their activity; (b) coaches or trainers who were insufficiently trained to notice injury; (c) misinterpretation or minimizing of significance of the body's signals (e. g., is it pain or just soreness from increased training volume and intensity?); (d) masochistic attitudes or 'addiction' to sport; or (e) the perceived life-style benefits achieved

through sport. Kent (1982) warned against procrastinating about seeking medical advice about possible injuries since acute injuries can turn into chronic conditions, such as arthritis, if not dealt with promptly.

Nideffer (1983) and Gordon et al. (in press-a) have called for more research to be done in the area of psychosocial aspects of the process of recovery from athletic injury since it appears that this process is not well understood. This is another reason why the present study was undertaken. The cognitive, affective and behavioral sequelae are discussed later.

Emotional Reactions to Injury

Until recently, there have been very little data collected on the emotional reactions of athletes to injury (e. g., Chan & Grossman, 1988; Smith, Scott, O'Fallon, & Young, 1990; Smith, Scott, & Wiese, 1990; Weiss & Troxel, 1986). Although some data have been collected on the response to injury in general, additional data are available (e. g., Little, 1969) indicating that people involved in athletics may react to injury in a different manner when compared to non-athletes, due to the unique demands of physical activity and competitive sport, or the special importance athleticism has in their lives (Gordon, Milios, & Grove, in press a). For example, if sport is a mechanism an athlete uses to diffuse anger, then depression and frustration might ensue once injury interferes with this person's coping mechanism. Similarly disbelief might follow an injury since an athlete might have to come to terms with his or her vulnerability (Samples, 1987).

For example, as mentioned above, Weiss and Troxel (1986) noted a number of emotional responses to injury in the athletes they interviewed including disbelief, fear, rage, and depression.

Recently, Chan and Grossman (1988) investigated the emotional reactions of runners who were unable to run for four weeks as a result of an injury. This emotional reaction was compared both with that of runners who continued to run, and the published norms for long distance runners on the Profile of Mood States (POMS) (Mcnair, Loor, & Droppleman, 1971). The POMS has well-established validity, but needs more studies on its reliability (Peterson & Headen, 1984). The results showed that the injured runners displayed significant mood and psychological

disturbances, including greater depression,anxiety, confusion, over-all mood disturbance, lower self-esteem, and greater dissatisfaction with body image as compared to the published norms for continuing runners.

Table 1

Examples of the Grief Response as Applied to the Injured Athlete

1. Denial/Disbelief:	"This can't be happening to me" "I'll be OK! I'll run it off
2. Anger/Frustration:	"That dirty so and so!" "I was stupid to go for that tackle"
3. Bargaining:	"OK, I'm hurt, I'll see the doctor and specialist, go for treatment - but only when it suits me! - I'll be back in time for the play-off's" "I'll sit this one out so I can play next week"
4. Depression:	"It feels like I'll never get back to playing" "I'm so sore it's hopeless"
5. Acceptance:	"I am injured" "OK what's happened has happened - no point in worrying anymore about that is there? Regret really is a waste of time, I must now try to help the team and do as much as I can to help myself"

Sources:

(Gordon,1986, p. 2; Musielewicz, 1989, p. 1-2, Rotella, 1984, p. 276)

Chan and Grossman concluded that this might either have resulted from the injured runners being prevented from partaking in an activity that was used for personal control, gaining mastery, and stress management, or from the sensations of withdrawing from the natural opiates that are produced by the body as a physiological response to habitual physical training.

More recently, Smith, Scott, O'Fallon, and Young (1990) examined athletes' emotional responses to injury on a longitudinal basis using the POMS, and a new instrument, The Emotional Responses of Athletes to Injury Questionnaire (ERAIQ). No reliability and validity data were described for the ERAIQ. The athletes served as their own controls and were also compared to the published norms of the POMS. The results highlighted several key points. Firstly, overall, the injured athletes demonstrated mood disturbances (e. g., frustration, depression, and anger) although these results appeared to be influenced by the more severe responses of severely injured athletes (23 out of 72 participants). Secondly, younger injured athletes demonstrated more anger than older athletes, exemplifying either the importance of age and experience of dealing with injuries, or the perceived negativity of the situation in younger athletes. Thirdly, the more severely injured athletes demonstrated greater mood disturbances, and these took longer to become more positive. Fourthly, emotional disturbances were inversely related to the athlete's perceived rating of recovery and the athlete's mood tended to improve over time. Smith, Scott, O'Fallon, and Young (1990) noted that the results did not support the grieving and loss cycle suggested by other authors, since the most seriously injured athletes had simultaneous elevations in anger, tension, and depression and no emotionally related stages were seen in this longitudinal study (up to four months). In a similar vein, they suggested that the presence of mood disturbance was not congruent with the denial aspect of the supposed loss and grieving process. Smith, Scott, O'Fallon, and Young (1990) suggested several reasons for the absence of denial, the most plausible being that the subjects were recruited from a sports medicine clinic and, thus, were already through the stage of denying their injury. In addition, many of the athletes had previous injuries and, due to experience in coping with injury, may not need to deny it. Finally, the wide range of responses to the questionnaires highlighted the individual nature of emotional response to injury and the need to deal with the psychological aspects of injury on an individual basis, again taking into account the meaning of the activity to the person.

Most recently, Gordon and Lindgren (in press) published a case study of a cricketer recovering from a back injury. The emotional responses gleaned from this article and the previously cited studies are shown in Table 2.

Fear and anxiety are other consistent reactions to athletic injury reported in the literature (e. g., Musielewicz, 1989; Rotella & Campbell, 1983; Rotella & Heyman, 1986). These writers state that fear of re-injury, loss of performance, or loss of their place on the team are common reactions of athletes, especially in association with the uncertainty that appears to accompany athletic injury. This can lead to loss of confidence, decreased self-image and self-esteem, and also a possible delay in the rehabilitation process.

Samples (1987) noted that an emotional response might only surface with the prospect of returning to the game, "the last thing you want to do is to go through the dam thing again" (p. 174). This may indicate that an athlete may be physically, yet not mentally ready to return to her/his activity, and this may explain why some athletes do not seem to progress in their rehabilitation as fast as a therapist might think they should (M. Young, personal communication, July 1989; Rotella & Heyman, 1986). On the other hand, other athletes might have a problem restraining themselves from re-entering the sport arena too soon. For example, Samples (1987) noted that "the hardest things for distance runners and competitive swimmers to do are to slow down, listen to what their bodies are trying to tell them, and not try to progress too fast".

In summary, the limited research and anecdotal data support the idea that an athlete's response to injury is often an emotional one. It is commonly accepted that emotions are tied to certain thoughts (cognitions). These thoughts are discussed next.

Table 2

Summary of Psychological Responses to Injury and Discontinuation of Activity Reported in the Research Literature. Asterisk denotes Source

Response	Chan and Grossman (1988)	Smith, Scott et al. (1990)	Gordon & Lindgren (In press)	Weiss & Troxel (1986)
Anger -Hostility	*	*	*	*
Confusion	*	*		
Decreased Confidence			*	
Depression, Disappointment	*	*	*	
Devastation			*	
Disbelief				*
Frustration		*		
Guilt				*
Helplessness			*	*
Inadequacy				*
Isolation			*	*
Less Vigor	*	*		
Loss of control				*
Lowered Self-Esteem	*			
Lowered Confidence				*
Overwhelmed by restrictions, and prospect of long-term recovery				*
Poorer Perceived body-image	*			
Tension-Anxiety, Fear or 'Scary'	*	*		*
Uncertainty			*	*
Upset			*	

Cognitive Issues

A few authors (e. g., Gordon, 1986; Rotella, 1984, 1988; Weiss & Troxel, 1986) have discussed the role of cognitions in reacting to an injury. These cognitions have often been related to the uncertainties raised by the injury as demonstrated by statements such as "When can I again?" to "Can I run again?", and may reflect the different personality characteristics of the individual. Thus, the former may come from an extrovert and the latter from an introvert (Sanderson, 1978). However, these ideas appear to be based on experience and theory, rather than rigorous empirical data.

Gordon (1986) and Rotella (1984, 1988) described a number of examples of other types of irrational self-talk that might go through the minds of injured athletes. For example, self-defeating thoughts might include, "I'll never be able to perform effectively again. I've ruined everything" (Rotella, 1984, p. 279), or if the therapist is late during rehabilitation the athlete might say."That idiot! Gives me the lecture yesterday about the importance of regular treatments in rehabilitation and then doesn't show up! She'd better apologize before I show up again. I've had it!" (Gordon, 1986, p. 4).

In what appears to be the first empirical evidence in this area, Weiss and Troxel (1986) noted what they labelled as "Irrational thoughts (a negative mind-set)" (p. 106), in the ten injured athletes they interviewed. Examples of this type of thinking were "What if..." statements (e. g., "What if I don't recover quickly?" (p. 106)). Weiss and Troxel (1986) noted that such statements might "perpetuate the anxiety, fear and demotivation surrounding the injury" (p. 106).

These types of thoughts may affect the healing process by heightening an athlete's anxiety, muscle tension and pain, as well as promoting less than helpful attitudes within the athlete. Additionally, demotivation caused by such thought processes may result in the athlete's not attending therapy.

Although I agree with the notion of dysfunctional responses to injury (e. g., not turning up for appointments, or swearing at a health professional), I also feel it is pejorative to label some ideas or behaviors as irrational, when they might be very understandable for the injured individual. Such

labelling may not encourage athletes to discuss their problems with a health professional for fear of being called "irrational" or a "difficult patient". Interestingly enough, Gordon and Lindgren (in press) noted the responses of two physiotherapists who thought that athletes who were impatient and never liked to be kept waiting, or seemed in a hurry, were examples of athletes with a "poor psychological adjustment to injury" (p. 8). Although I believe that there can potentially be some more constructive ways of coping with annoying situations than getting angry,(e. g., as discussed in the next section), the 'irrational' beliefs seem to be on behalf of a health professional who does not expect a busy client to be angry after being kept in a waiting room for 20 minutes! The expectation from the health professional appears to be that an athlete should be a 'good client' who sits back and takes his/her medicine and is easy-going about delays in treatment, even though these delays may be to the detriment in the client. Interventions concerning this point may include assertiveness training for the client, and value awareness or empathy training for the therapist (e. g., Pedersen, 1986)! Interestingly enough, a therapist training program is to be implemented as part of Gordon et al. 's three part study (Personal Communication, July, 1990).

Thus, there seems to be evidence to support the cognitive aspects of injury. If the cognitive aspects are obviously dysfunctional, these thoughts may be the focus of interventions such as reality testing or reframing. These interventions are briefly described in a later section of this dissertation. However, other issues, including those related to the meaning of the injury to the athlete, will first be discussed.

Existential and Developmental Issues

An athlete's response to an injury will occur within the context of the personal meaning of the injury to the athlete. More specifically, it will most likely occur in terms of the effect of the injury in obstructing an athlete from fulfilling his or her needs.

Eldridge (1983) and Deutsch (1985) suggested that the existential and developmental consequences of being injured must be examined. Both writers have suggested that an athlete will react to an injury based upon its symbolic meaning. This meaning may change depending on

the phase of an athlete's development, and he or she will react to that injury based upon the developmental needs at that time.

From a theoretical perspective, Eldridge (1983) noted the effect that an injury can have on an individual's identity and self-concept. People who have a narrow source of self-esteem, based exclusively on sports, or a weak self-concept based on sport (e. g., high school athletes [Samples, 1987]), may be at risk for pathological psychological reactions to injury. Similarly, physical scars, decreased sporting performance, and a fear of future incapacities or helplessness can all have an impact on an individual who invests in sport for narcissistic reasons. In addition, the meaning of an injury to an athlete going through adjustments to middle age, specifically, if the injury interferes with a mechanism to offset the aging process, may result in a severe psychological reaction. In this regard, Little (1969) presented data on what he called the 'athlete's neurosis'. Little noted that middle-aged males possessing a personality variable termed "athleticism" (a high level of pride in physical fitness and health) displayed a disproportionate neurotic response to minor illness and injury, despite having an absence of normal neurotic markers (e. g., psychiatric disturbance in the family of origin). Little (1969) concluded that an overvalue on athleticism can lead to a neurotic reaction in response to a meaningful threat such as illness or injury. Thus, although this threat may seem trivial to someone else, the effect of the threat should be understood from the perspective of the individual's needs.

Deutsch (1985) presented two case studies which investigated the perceived severity and meaning of the injury to the athlete. Deutsch's data indicated that physical activity can have a strong influence in people's lives in terms of their need fulfillment. If these fulfilling activities have been taken away, this can lead to severe emotional reactions (e. g., anger or depression) and, also, a problem of finding alternative methods to satiate the remaining needs.

Eldridge (1983) and Deutsch (1985) insisted that the meaning of an athlete's injury should be interpreted within the context of the athlete's personality type, stage of development, the specifics and meaning of the injury, and the role sport plays within the athlete's life. Helping an individual to generate alternative ways of meeting his or her needs may then be appropriate. Little

(1969), Eldridge (1983) and Deutsch (1985) appear to be three of the few studies which have acknowledged the concept of the meaning of the injury to the athlete.

Nideffer (1983) also commented on the neurotic-type reactions to injury displayed by 'addicted' runners. This reaction appeared to surface as a result of fears of losing fitness or of gaining weight as a result of not being able to run. It is my opinion that these reactions may demonstrate the phenomenon that "You don't know what you have got until it has gone". Thus, the underlying need for participation in sport (e. g., weight control, self-esteem, anger control, and affiliation needs) may surface once the activity used to fulfill that need is no longer available.

The Appropriateness of an Athlete's Response to Injury

Crossman and Jamieson (1985) studied the nature of idiosyncratic responses to injury. These authors compared an athlete's perception of injury severity to that of the perception of their trainer. The authors found that athletes who were considered by their trainer to have overestimated the seriousness of the injury reported more pain, higher state anxiety, and tended to compete at lower levels of competition. Crossman and Jamieson posited that the athletes who experienced more emotional trauma may show slower rates of recovery. However, this assertion has not been empirically assessed.

Although it appears important to deal with the emotional sequelae of being injured (Rotella & Heyman, 1986), it is difficult to say what is, and what is not an appropriate reaction to an injury. For example, the perception of the pain associated with an injury is dependent on cultural and familial learning, and is "what the patient say's it is and not what we think it should be" (Health and Welfare Canada, 1984). Thus, it is perhaps presumptuous to say what connotes an overestimation of an injury. To do so may deny the athlete's individual experience. This may be a further indication that the subjective experience of an injured athlete should be taken into account and not overlooked.

Withdrawal Sensations

A final area that appears to be important in reacting to injury, is that of potential withdrawal sensations. Yaffe (1986) cited Morgan's (1979) concept of negative addiction, which is in strict contrast to Glasser's (1987) idea of positive addiction (see chapter five). Thus, as exercise is

ceased as a result of injury, deprivation sensations, which are similar to being addicted to a drug, can commonly follow. Robbins and Joseph (1985) noted the following common withdrawal effects after the cessation of exercise: irritability, depression, frustration, guilt, and insomnia. These withdrawal symptoms may occur as a result of changes in body chemistry incurred as a result of habitual exercise, the loss of reinforcement from a source of self-fulfillment, or even the loss of a therapeutic stress-management mechanism (Robbins & Joseph, 1985).

Interestingly enough, some of the emotions described above as resulting from injury may also be described as 'withdrawal' symptoms. Since these responses may occur as a result of psychological or physiological reasons, it is important for the health professional to know the source of the symptoms. Thus, appropriate interventions should be planned to replace the need fulfilling activity (e. g., find an alternative way to express anger).

Factors Affecting the Psychological Reaction to Athletic Injury.

As has been discussed above, a number of factors might influence an athlete's reaction to an injury. These are summarized in Table 3. Such factors might account for the wide range of emotional reactions to an athletic injury found by Smith, Scott, O'Fallon, and Young (1990). It should be noted, however, that there appears to be no empirical validation of these factors. The following list has been generated from theoretical papers, interviews of injured athletes, and a survey of sport physiotherapists. Due to restrictions of space, these factors are not discussed here, and the interested reader is encouraged to refer to the original articles.

Thus, a number of factors appear to play a part in the athlete's response to an injury. Those factors appearing in Table 3 appear congruent with the stressor models of athletic injury espoused by Weiss and Troxel (1986) and Weiss and Wiese (1987). These models are discussed in the section on rehabilitating athletes.

Comparison of Athlete's Responses to Injury Compared to the General Public

Gordon et al. (in press-a) appear to be the only authors who have researched the difference between athletes' and non-athletes' responses to injury.

Table 3

Factors Affecting an Athlete's Reaction to Injury. Asterisk denotes source.

Factor	Gordon, et al. (In press-a)	Sanderson (1978)	Weiss & Troxel (1986)
Individual's Personality	*	*	*
Individual History of Injury	*		
Previous injury of similar type			*
Nature/Severity of the Injury	*		*
Level of Competition	*		*
Intensity of involvement with sport			*
Time of the Season	*	*	*
Stage of Athlete's Career		*	*
Type of Sport		*	
External Pressures from family, coach, teammates		*	
Self-Motivation for Rehabilitation		*	
Athlete's faith in therapist			*
Athlete's confidence in diagnosis			*
Injury caused by an athlete's lack of preparation			*
Experience of the athlete			*

The main reported differences were that athletes react more promptly to get rehabilitation, are more concerned with the time frame of recovery, and may demonstrate more of a response to injury. On the other hand, members of the general public appear more concerned with the pain of the injury rather than other consequences of the injury. In the main, the responses of athletes and non-athletes were reported a being quite similar.

Summary

A number of different psychological reactions may occur as a result of an athletic injury. Danish (1986) stated that "Being injured threatens not only an athlete's physical well-being, but acts as a

threat to the athlete's self-concept, belief system, social and occupational functioning, values, commitments, and emotional equilibrium" (p. 346). Thus, although a number of reactions to injury have been noted, the effect of the reactions on the rehabilitation process can only be hypothesized at this time. However, an athlete's psychological reaction to his/her injury may be a crucial aspect of the rehabilitation process and should be investigated further. For example, decreases in self-concept might result in a decrease in self-care, or an athlete's expectations for recovery may be incongruent with the severity of the injury. It would seem that knowledge of these factors would be useful for the therapist's intervention strategy. Samples (1987) called for more documented description on the psychological effects of injury. This appears particularly appropriate given the paucity of empirical data in this area.

Evidence for the psychological responses to injury have promoted the use of phrases like "Treat the person, not just the injury" (e. g., Gordon, 1986; Rotella & Heyman, 1986; Weiss & Troxel, 1986). The area of psychosocial rehabilitation for the athlete is discussed next.

Psychosocial Aspects of Rehabilitating Athletic Injuries

Given the increased interest in the psychosocial dimension of athletic injuries and evidence of the cognitive, behavioral, and emotional challenges that an injury presents to an athlete, more authors are now considering the role that counselling or psychotherapy can play in the rehabilitation of sports injuries (e. g., Nideffer, 1983; Rotella, 1984; Rotella & Heyman, 1986). However, little research has been done in this area and some of the difficulties in investigating this area are discussed at the end of this section. The areas discussed in this section include: assessment, treating the injury as a stressor, the tasks of optimal rehabilitation, coping with problematic thoughts, coping with isolation/withdrawal issues, educating the athlete, psychological techniques for facilitating healing, enhancing motivation and adherence to therapy, environmental factors, pain management, therapist training, working through grief, redirecting energies, social interventions, and other factors. This is not a comprehensive survey and the interested reader is encouraged to follow up on the cited references.

Assessment

An assessment of an athlete's cognitive, behavioral, and emotional reaction to an injury is an important first step in identifying the meaning of an injury to an athlete, the need for intervention, and the areas where such interventions might be appropriate. Lynch (1988) suggested that this assessment should be performed by a clinical sport psychologist, and that the assessment might be carried out in conjunction with the educational component of rehabilitation.

Smith, Scott, and Wiese (1990) reported on a novel approach to treatment of the psychological concerns of injury at the Mayo Clinic Sports Medicine Program in Rochester, Minnesota, U. S. A. If an athlete is considered as needing psychological help, a referral is made to a nurse counsellor in psychology. An assessment of the athlete's emotional state, coping resources, reasons for doing their sport, outside pressures, life stresses, social support, and the meaning of the injury is done via an interview and answers to the POMS, and ERAIQ (see Smith, Scott, & Wiese, 1990, for a copy of the ERAIQ). Eldridge (1983) is another source of possible assessment questions to ask the injured athlete.

Interestingly enough, Smith, Scott, and Wiese (1990) noted that two injured athletes who were suicidal were caught by this screening procedure. They also suggested that those athletes who demonstrate obsessive exercise behaviors might need psychiatric consultation. The need to be alert for such clients has been supported with evidence from Pillemer and Michelli (1988). Their data were based on 32 athletes who suffered from minor injuries (e. g., tendinitis), yet failed to recover as expected. A large proportion of these athletes were young (75% were under 21 years of age). These authors cautioned that many young athletes (especially female) presented with excessive dieting and exercising habits, and 37% of these athletes had one parent suffering from psychiatric illnesses such as chronic depression, or manic-depressive disorders. Discovering a history of multiple injuries, Pillemer and Michelli suggested that injury in such young people may be functional, and noted a similarity to Sanderson's (1977) idea of the 'injury-prone' athlete. Thus, the secondary gains of the injury might include masking a severe depression, withdrawing away from adolescent concerns, escaping from an activity whilst 'saving face' (e. g., when pressured to

compete by parents [Musielewicz, 1989, Samples, 1987]), or even bringing emotionally distant parents together. These secondary gain factors might impede progress in therapy. Pillemer and Micheli (1988) illustrated this point with the case of a gymnast suffering from Reflex Sympathetic Dystrophy (RSD) which was resistant to treatment. Although outwardly a normal 16 year old female, interview and other diagnostic data indicated that she was depressed with low self-esteem, she was having trouble at school, and she came from a stressed family. Apparently, involvement in athletics had improved her mood. However, recently, her athletic performance had waned and now she said she felt average as an athlete. "She had lost the one activity in her life that had made her feel special" (p. 687). In addition, she had been accosted by a strange male while jogging with friends. The injury thus helped her avoid an activity in which she was not performing well, keep indoors from muggers, and keep away from school, which she did not like. Such stories are compatible with anecdotes about athletes' reactions to injury and the meaning this injury had to them, recounted by a sports orthopedic specialist (Dr. D. C. Reid, personal communication, 1989). Assessing the psychosocial reasons why an athlete's injury does not improve as expected also appears more adaptive and less pejorative than labelling the person a 'malingerer' or 'wimp', which can often be the reaction of coaches or teammates (see Rotella & Heyman, 1986). If an athlete does not want to return to play, this choice should be respected, and perhaps the athlete may need referral to a psychology professional (Samples, 1987) for counselling and an exploration of alternative ways their needs can be met.

Thus, although rare, the potential for the functional aspect of injury should not be overlooked and neither should the need for psychiatric intervention. Assessment of the athlete's reaction and the meaning of the injury, therefore, seems essential to a holistic approach to treating athletic injuries. Specific techniques for coping with the psychosocial aspects of injury are discussed below.

Treating the Injury as a Stressor

Authors such as Gordon (1986), Lynch (1988), Nideffer (1981, 1983), Rotella (1984, 1988), Smith, Scott, and Weiss (1990), and Weiss and Troxel (1986) have proposed models to cope with

an injury as a stressor. Skills for dealing with the injury-stressor, can then be implemented or learned with reference to these models. These theoretical guides to treatment have been developed from other models of stress coping (e. g., Smith, 1984), and have discussed four phases of coping with a stressor. These include: (1) The Situation (e. g., the injury and its context), (2) Appraisal of the situation (e. g., of personal resources, the meaning of the situation, the demands of the situation), (3) Emotional responses to this appraisal (e. g., somatic feelings, and thoughts), and (4) Behavioral consequences (e. g., performance, inability to achieve goals, adherence to therapy). These stages of response are seen as interacting with each other. Thus somatic responses will affect cognitive appraisal. Some of these responses may get in the way of healing the injury as well as being upsetting for the athlete. For example, muscle tension resulting from the perceived stress of the injury and the pain response can occur around the injury site and result in decreased blood flow, thus prolonging healing (Weiss & Troxel, 1986). Interventions might then be aimed at alleviating dysfunctional responses at the appraisal and response stages (e. g., relaxation or cognitive restructuring).

A number of authors have suggested applying pre-existing psychological skills training paradigms to the area of coping with sports injury. These include: Psychological Skills Training (PST) (Martens, cited in Weiss & Troxel, 1986), and Rational Emotive Therapy (RET) (Gordon, 1986; Rotella, 1984; Lynch, 1988). Others have developed programs of their own (e. g., Faris, 1985). These programs seem to have a common paradigm of education, skill learning and development, and practice under a graded series of stressful conditions (e. g., low stress - trying to get to sleep, to high stress - sitting on the bench watching teammates play). In this way they are very similar to Meichenbaum's (1985) Stress Inoculation Training. Examples of the interventions suggested are included below. First, however, an alternative conceptualization of how to adapt to an injury is discussed.

The Tasks Of The Athlete Coping With The Stress of Injury

An alternative model of adapting to the stress of an injury has been developed by Rotella (1984). He has conceptualized this adaptation in terms of tasks that need to be fulfilled. Rotella

adapted Moos and Tsu's (1979) crisis intervention models, and the eight major adaptive tasks that patients need to accomplish if they are to adjust to an injury. Due to restrictions of space, these stages will not be described in detail here. For further detail please refer to the original references. These tasks are related to the reactions of athletes in the last section. The tasks are:

1. Effectively respond to the discomfort, pain, loss of control, and disfigurement of the injury.
2. Coping with the stresses of special treatment procedures.
3. Develop rapport with training room staff.
4. Maintain a reasonable emotional balance.
5. Maintain a healthy self-image or identity.
6. Maintain relationships with family, friends, teammates and coaching staff.
7. Prepare for an uncertain future.
8. Accept the limitations and restrictions imposed by the injury and adjust lifestyle goals accordingly.

In order to complete these tasks, an individual will have to mobilize a number of coping skills, which he or she may or may not possess. If the latter is the case, and the injury proves too much for their coping abilities, psychological reactions (e. g., depression) may signal that it is time to learn some new skills. In order to operationalize these skills, examples of some of the interventions available are described below.

Coping with Problematic Thoughts

The methods of coping with thoughts that could obstruct an athlete's rehabilitation (e. g., uncertain thoughts leading to anxiety, muscle tension and further pain, depression and demotivation) are many and varied. All the authors discussed below have emphasized that an athlete needs to become aware of his or her 'self-defeating' inner dialogue, and replace these with more positive self-statements. For example, Rotella and Heyman (1986) suggested that cognitive restructuring can help prevent an athlete from catastrophizing about the situation, help view the injury from a more positive perspective, and control their emotional reactions. The examples cited in the literature are adaptations of therapeutic techniques such as Rational

Emotive Therapy (RET) (e. g., Ellis & Bernard, 1985), and Thought Stopping (e. g., Meichenbaum, 1985; Rotella & Heyman, 1986). Examples of authors who suggested using the RET and/or cognitive restructuring approaches include Rotella (1984) and Gordon (1986).

Gordon (1986) suggested that cognitive restructuring can aid a person through denial, help confront self-pitying attitudes which may obstruct active coping, and generally "enables seriously injured athletes to translate a counterproductive 'Why me?' concern into a constructive 'Now it has happened what do I do I about it'" (p. 5). Such techniques also may help athletes verbalize their fears about the future, and assess the realism of those fears. In addition these techniques may be a useful way to cope with anger and depression, two of the most commonly cited emotions associated with injury.

Weiss and Troxel (1986) espoused a similar technique when they proposed the use of positive affirmations in place of anxiety provoking thoughts. These authors also suggested the use of visualization so that the athlete can prepare to overcome obstacles in therapy (e. g., lack of improvements in function).

Lynch (1988) also proposed the idea of reframing to deal with problematic thoughts. Thus, instead of seeing an injury as a crippling blow to their career, athletes might want to choose to look at an injury as a challenging opportunity to focus on other aspects of their game (e. g., technical skills and tactics), or parts of their life (e. g., social or familial), and also perhaps see things from a new perspective (e. g., re-evaluating priorities). For example, activities like 'shagging balls' for a volleyball team might be a new experience for a superstar; this may help the athlete to become a better team person, as well as modelling this behavior to other teammates (Rose et al., 1990).

Finally, several authors have discussed the role of an athlete's attitude in rehabilitation (e. g., Faris, 1985; Gordon et al., in press-a). For example, Faris (1985) suggested that prevailing attitudes such as 'more is better' may be counterproductive to therapy, since it may help them ignore the feedback of the body. Likewise, Gordon et al. (in press-a) noted the attitudes of athletes that enhance rehabilitation (e. g., assuming responsibility, good communication, and cooperation) and those that may impede rehabilitation (e. g., lack of compliance, missing

treatment, not listening, and goofing around during treatment). Cognitive-behavioral methods may be useful to identify the dysfunctional attitudes towards therapy and the therapist (and/or significant others like the coach) and replace these dysfunctional attitudes with more useful ones.

Coping with Isolation and Withdrawal Issues

Some athletes state that being injured keeps them emotionally or physically isolated from their team. Weiss and Troxel (1986) and Musielewicz (1989) suggested that an athlete should be given a choice of whether or not to maintain contact with the team during injury, since this choice is likely to be an individual preference. Some athletes may wish to keep involved with the team (e. g., by keeping statistics, or by helping coach the team), while others may wish to keep away. Teammates and coaches might also withdraw from the athlete by not knowing what to say to them. Modelling the listening behavior of the trainer or therapist might also encourage teammates, coaches, and family members to listen to the player's story, rather than model denial by avoiding talking about the issues. This approach can help lighten the depressed athlete's mood (Smith, Scott & Wiese, 1990).

Educating the Injured Athlete

Gordon et al. (in press-b) noted that therapists characterized a large part of their behaviors in therapy as education and explanation. Many other authors have noted the need for effective education of the injured athlete in order to help alleviate the feelings of frustration, uncertainty, and helplessness which can be associated with the injury. Useful information appears to include the meaning of the diagnosis and prognosis of the injury, the nature of mind-body interactions, and the need for mental skills to cope with injury (Lynch, 1988; Weiss & Troxel, 1986), to what needs to happen for healing to occur (Gordon & Lindgren, in press), what sensations the patient will feel (Singer & Johnson, 1987), how to tell when healing has occurred (Faris, 1985), aspects of positive attitudes towards rehabilitation, and information on how to cope with other people (e. g., answering questions like "How's the cripple nowadays?") (Gordon, 1986; Gordon et al., in press-b).

Interestingly enough, Gordon et al. (in press-a) noted that the physiotherapists they surveyed perceived that providing sensory information was a less important task for them, although providing realistic goals for recovery and timelines for their completion for the athlete was a major function. With respect to goal-setting, Garrick (1981) has also suggested that the familiar question "When can I...(run again)?", should not be answered in temporal terms (e. g., days, weeks), but in terms of goals based on sequential stages in the rehabilitation process (e. g., when you can walk fast without limping then we might start some light jogging).

In addition, the information about the injury should be realistic and should include the possibility of relapses (Weiss & Troxel, 1986). Musielewicz (1989) suggested telling athletes what are the potential obstacles to recovery, and how to cope with them. Lynch (1988) has also suggested showing or telling the injured athlete about people who have successfully recovered from similar injuries, thus fostering their hope.

A central tenet of information giving is that increased knowledge decreases anxiety and uncertainty, and empowers the individual by giving the person more control over the situation (Rotella & Heyman, 1986; Singer & Johnson, 1987). Thus, by giving athletes knowledge about the experiences that they may go through, may help the athletes cope with the psychological aspects of injury (Gordon et al., in press-b; Rose et al., 1990). Gordon and Lindgren's (in press) discussion of an injured cricketer supports this notion.

Facilitating Healing

Relaxation/Guided Imagery/Biofeedback. Relaxation training can help the healing of an injury by decreasing pain, reducing muscle tension (Nideffer, 1981), aiding the athlete in getting to sleep (Weiss & Troxel, 1986), and conserving energy for healing (Gordon, 1986). A variety of techniques can be used, including progressive muscular relaxation, autogenic training and biofeedback (Gordon, 1986), and mental imagery or Benson's relaxation response (Smith, Scott & Wiese, 1990). Relaxation tapes are available from public libraries and some health professionals (e. g., psychologists).

Guided Imagery techniques can be used to promote relaxation, dissipate the arousal associated with anger, raise white blood cell counts and promote healing (Lynch, 1988). Different types of imagery have been discussed by Gordon (1986), Rotella (1984), and Smith, Scott, and Wiese (1990). In addition to physical healing, mental images can help athletes gain some control over their injury situation by seeing themselves as healthy (positive expectation), and overcoming obstacles in therapy (e. g., mastery over plateau's in progress [Gordon et al., in press-a, Gordon, 1986]).

Biofeedback has been used in helping rehabilitate sports injuries. For example, Nideffer (1981), cited a University of Rochester study, in which psychological pain grading, pharmacological intervention and biofeedback to relax affected muscles resulted in quicker returns to practice. Nideffer also mentioned that athletes sought treatment earlier too, since they were not afraid to come in to the training room. Beall, Diefenbach, and Allen (1987) also cited three case studies in support of electromyographic (EMG) biofeedback as a successful treatment for voluntary posterior instability of the shoulder in athletes. Biofeedback aided the athletes to become aware of dysfunctional neuromuscular patterns and to retrain these patterns to provide more stability to the shoulder.

An interesting study which combined biofeedback and a psychotherapeutic modality known as systematic desensitization (Wolpe, 1958), was used to help an athlete combat the fear of reinjury she experienced before returning to play (Rotella & Campbell, 1983). The athlete returned to playing basketball with less fear of reinjury. However, since this was a case study, it is difficult to discriminate between the effects of the psychological strategy independent of the physical therapy also received. Nideffer (1983) also proposed systematic desensitization as an intervention to alleviate anxiety in injured athletes.

In addition to relaxation training, injured athletes may need to be taught skills to aid motivation and adherence to therapy.

Enhancing Motivation and Adherence to Therapy

Enhancing motivation and adherence to therapy might be facilitated by goal setting. A number of factors affecting adherence to treatment are discussed in this section.

Goal setting. "Compliance or adherence to medical regimens is notoriously poor" (Danish, 1986 p. 347). Danish went on to suggest that rapport, development of communication skills, and collaborative goal setting are major determinants in enhancing treatment program adherence for athletic injuries.

Collaborative goal-setting between health professionals and athletes should theoretically increase intrinsic motivation for the program and help decrease the athlete's uncertainty. Weiss and Troxel (1986) noted that the athlete's unrealistic expectations about a quick recovery from a severe injury may result in the athlete's feeling overwhelmed by a lengthy rehabilitation process. Thus, it appears that short term goals should be emphasized, along with specific guidelines for making these goals effective. Goals may be defined in terms of sensations (e. g., pain levels or signs of healing [Samples 1987; Weiss & Troxel, 1986], or functions [Garrick, 1981]). Goals should be written down, measurable, and include concrete strategies for their achievement (Weiss & Troxel, 1986). Frequent assessments can give the patient feedback as to goal attainment, as well as information concerning the efficacy of the treatment to the therapist.

Smith, Scott, and Wiese (1990) suggested that such goal setting programs help athletes cope with frustration, depression, tension, and anger, by decreasing the uncertainty associated with the injury. They concluded that to maximize compliance the most appropriate program for athletes should be "problem-focussed and behaviorally oriented with clearly expressed, dynamic, achievable goals providing direction to the rehabilitation programme" (p. 368).

Although collaborative goal-setting can help an athlete adhere to a program, other factors can also help influence program adherence.

factors affecting adherence. Empirical research into the factors related to adherence to sports injury rehabilitation is notable in its scarcity, despite anecdotal data suggesting that this area presents a problem (Duda, Smart, & Tappe, 1989). Eichenhofer, Wittig, Balogh, and Pisano

(cited in Duda et al., 1989) noted that athletes who experienced more somatic anxiety, were less likely to adhere to their rehabilitation program. Fisher, Domm, and Wuest (1988) noted that collegiate athletes who adhered to therapy were more self-motivated, tolerated pain better, perceived they worked harder at their rehabilitation, and were less bothered by the scheduling of sessions and environmental conditions of athletic training.

Recently, Duda et al. (1989) examined the relationship between the three facets of personal investment (personal incentives, sense of self-beliefs, and perceived options) and adherence to rehabilitation. Their results indicated that a person would adhere to their program if they thought treatment was effective, perceived they had more social support for rehabilitation, were self-motivated and goal directed, and were task oriented towards mastering their sport (i. e., more effort equals better results).

Thus, motivational factors for treatment program adherence lie both within and outside the athlete. The implications of these studies may be noted as follows: to assess the athlete's level of goal directedness, for the therapist and others to support the athlete who has difficulty adhering to the program, to help develop an athlete's belief in the therapy, and for the sessions to be conducted at a convenient time and in a conducive environment for the athlete.

In addition to motivation, pain management is one area that has been discussed in the literature.

Pain Management

Athletes vary in their ability to tolerate pain. Some may 'suck it up and go' (Rose et al., 1990), yet others may not be able or willing to tolerate the pain or discomfort associated with an injury, and may require a number of interventions to help them manage the pain. Singer and Johnson (1987) categorized pain management strategies as physical, behavioral, and cognitive. The behavioral and cognitive interventions are briefly listed here. Behavioral interventions such as modification of pain behavior by operant conditioning may be useful for athletes suffering from chronic pain (i. e., pain that has lasted for six months or more). However, this paradigm has been criticized by Singer and Johnson (1987) for ignoring the mental and emotional aspects of pain, and also may not be appropriate for athletes suffering from acute pain.

Gordon (1986), Nideffer (1981), and Singer and Johnson (1987) are only a few of many authors who have supported the use of a number of cognitive techniques for managing pain. Techniques such as information giving, EMG and Electroencephalogram (EEG) biofeedback, relaxation, meditation, self-hypnosis, imagery rehearsal, mental distraction or dissociation, and group therapy have all been suggested as being useful in reducing the pain associated with injury. These techniques might be particularly effective in breaking the anxiety-muscle tension-pain feedback cycle which can help prolong recovery from injury (Nideffer, 1981, 1983).

Samples (1987) noted one practitioner's need to distinguish between pain that requires medical attention and pain that indicates emotional distress. For example, 'phantom pain', derived from a fear of reinjury, might be alleviated with mental imagery techniques such as Alexanders' "Imagining the road to recovery" (cited in Samples, 1987).

Nideffer (1981,1983) and Singer and Johnson (1987) expressed two concerns about the moral and ethical issues associated with pain treatments for athletic injuries. Firstly, who should provide the service? These authors pointed out that the service should be provided within one's area of competence and level of expertise within that field. If the service provider is not competent, then a referral to a qualified professional is appropriate. For example, a sport psychologist should always check with an expert in physical aspects of injury (e. g., physiotherapist or physician) before recommending cognitively-based pain control strategies. Similarly, psychological techniques should only be given by a qualified individual. However, although there are clear guidelines as to who can be called a Psychologist in Alberta, to this author's knowledge, issues such as who is 'qualified' to give relaxation training and 'counselling' interventions do not seem to have been clarified. This appears to be an issue for further debate.

Secondly, any pain-reducing strategy may also be misused if the strategy directs attention away from the pain messages coming from the body. This may allow a person to perform an activity while still injured and consequently the person may damage him/herself even more. This is especially true for athletes with acute injuries which may then become chronic (Singer & Johnson, 1987).

Therapist Training

Various authors have espoused the application of communication skills (e. g., active listening and paraphrasing) for the health professional involved in physically rehabilitating athletes (Danish, 1986; Gordon, 1986; Gordon et al., in press-b; Pedersen, 1986; Weiss & Troxel, 1986). This aspect of training may not have been developed in health professional's traditional training.

Instruction in communication training might help therapists become more aware of the psychological aspects of being injured (Faris, 1985). The need for good communication skills, the projection of empathy, and a non-threatening environment may be essential to allow athletes to speak about their feelings, particularly in the light of data which suggests that athletes typically do not divulge those aspects of themselves (e. g., negative emotions) which might be construed as a weakness (Carmen, Zerman, & Blaine, 1968; Samples, 1987).

Faris (1985), for example, highlighted the need for information to be given to the athlete in understandable terms. Thus, a therapist may want to become aware of the technical language that he or she uses (and takes for granted), and of the verbal or non-verbal signals given by the athlete that might indicate an understanding, or lack thereof, of the language.

The results of studies by Gordon et al. (in press-a, in press-b) have highlighted the need for physiotherapists to be trained in the area of psychological aspects of injury recovery; particularly with respect to helping therapists address the issues of athletes' non-compliance, poor attitudes, and lack of motivation related to therapy. Gordon et al. (in press-b) initiated this process by giving some educational guidelines for sport physiotherapists. In addition to communication skills, they also recommended a working knowledge of cognitive restructuring, behavior modification, visualization techniques, goal setting principles, providing knowledge and sensory information, and social support techniques, especially those aspects pertaining to the rehabilitation process. Other authors have also noted a role for psychologically aware therapists to assist the athlete to 'work through' the grief process.

Working Through the Grief

Pedersen (1986) promoted the idea that athletic trainers might act as facilitators in the grief process. More specifically, she mentioned that by non-judgemental, empathic listening and other communication skills, a therapist can help an athlete 'work through' the grief associated with the losses associated with athletic injury. This approach is based on the premise that "Grief that is openly and completely expressed is more likely to result in a healthy adjustment" (Pedersen, 1986, p. 312). However, it should first be noted that some of the more traditional precepts of grief counselling have recently been challenged, and thus this approach may or may not be useful (Wortman & Silver, 1989). Secondly, the notion of a 'grieving' response to injury may not be appropriate given the data from Smith, Scott, O'Fallon, and Young (1990). Grieving may also be a label that authors have used to describe an athlete's 'psychological process' following injury, yet many authors have said that an athlete's psychological process post-injury is not yet well understood and requires further investigation (e. g., Gordon, 1986; Weiss & Troxel, 1986). Thus, to use a label such as grieving may give the illusion of understanding a process which is still not well understood. This appears to be an example of where a pre-existing theory, generated from another substantive area (death and terminal illness), has been placed onto a new area without research data to support this application, particularly in light of the fact that the majority of athletic injuries appear to be healed given time. It is for this reason that Grounded Theory methodology is being used in the present study (this is discussed further on).

Whether or not an athlete's response to an injury is one of grieving, redirecting the energy usually preserved for sport can help alleviate the impact of the injury.

Redirecting Energies

Weiss and Troxel (1986) and Musielewicz (1989) noted a need for injured athletes to redirect the energy that they usually dissipate through sport activities. Often the hour spent in therapy does not replace the three hours normally allotted to sports practice. The resulting surplus energy may be manifested in a variety of forms including restlessness, irritability, anxiety, anger, or frustration. Thus, changes in lifestyle may be needed. These changes might include doing some

form of alternate physical activity, (e. g., swimming rather than running, or helping out with the team), or perhaps catching up with neglected socializing (Galway & Mainwaring, 1989). Increasing technical knowledge of the sport might also be a potential strategy here (Weiss & Troxel, 1986). Such activities might help alleviate the depression and tension associated with not being able to exercise and feelings of helplessness (Smith, Scott, & Wiese, 1990). These authors also suggested that spending some time mentally rehearsing sport skills can also help to cope with the tension associated with athletic injury.

Social Interventions

Role models, coaches, peers and family. Many authors have espoused the positive role that social support (e. g., emotional support from significant others) has on an injured person's recovery (e. g., Danish, 1986; Duda et al., 1989; Lynch, 1988; Smith et al., 1990). For example, social interactions can afford an athlete the opportunity to share her/his feelings with others, thereby releasing tension and anxiety (Lynch, 1988). Rose et al. (1990) described the types of people who may be involved in supporting the athlete's return from injury, and the roles that they might play.

Two specific ideas were suggested by the athletes interviewed by Weiss and Troxel (1986). The first idea was peer modelling (e. g., talking to people who have had the same injury, and recovered). A peer can provide hope, information about what to expect and coping ideas, and also the feeling of being understood. The second idea was that of an injured athlete's group, where information, support, and personal concerns about the injury and rehabilitation of the injury can be shared and discussed. These interventions may also help alleviate the feelings of loneliness and being misunderstood by others. Again, getting the athlete involved in the team at some level (if they wish) may also help alleviate the depression associated with the feelings of isolation and exclusion often felt by athletes (Smith et al., 1990).

Smith et al. (1990) recommended that the injured athlete should interact frequently with the rehabilitation team to help assess rehabilitation plateaus and receive encouragement. In addition, "communication between the coach, the athlete, and the sports medicine team is mandatory so

that realistic performance goals can be set and the athlete can be eased back into practice and competition" (p. 365). Rose et al. (1990) agreed, and gave some concrete examples as to how the coach, athlete, and therapist might interact to share physiological and technical knowledge that can be used in the recovery program.

It was mentioned above that the therapist may want to gain more training in communication skills. This may also useful for the coach, especially in light of anecdotes that some coaches try to push their athletes back into play before the athletes are ready to play. Thus, coaches may want to become aware of both the verbal ("take your time"), and non-verbal ("If you not back soon, #4 will take your spot") messages they provide to the athlete in order to avoid mixed messages which may be picked up by the athlete (Rose et al., 1990). Rotella and Heyman (1986) described the behavior of some coaches towards injured athletes. These behaviors, although innocent, may be interpreted by the athlete as telling them that they should be guilty for being injured, that they are letting the team down, or that they are wimps, malingerers, and not committed to the team. These misinterpretations can then lead to further bad feelings, perhaps delays in recovery (e. g., the athlete might think "Why should I bust my butt for that !@#$%^! guy!), or even withdrawal by the athlete from the sport altogether.

Coaches can also help an athlete get through the denial stage by, (a) becoming aware of an injured athlete's denial-type behaviors (e. g., not going in for therapy, although obviously limping, (b) gently confronting these behaviors with observations of injury behaviors ("I see you're limping Johnny!"), and (c) delineating team policies to deal with such cases ("You are not playing until you get that seen by the trainer"). Coaches can also encourage the athlete to be part of the team when injured, while being sensitive to the fears of athletes, even if the athletes appear 100% physically ready to return to sport (Gordon et al. in press-b; Rose et al., 1990). Rotella and Heyman (1986) suggested that coaches should be aware that substitute players may suppress injury in order to stay on the team roster; these athletes should be watched especially closely to ensure that further injury does not occur.

Family and friends of injured athletes may also benefit from educational literature about the psychological response to injury, so that they can understand their roles in helping promote an injured athlete's psychological, as well as physical healing (Gordon et al., in press-b).

The relationship between the injured athlete, friends, coaches, and family appears important to recovery. So, too, is the relationship between the athlete and his or her health professional.

Professional-athlete relationships. The influence of external factors on therapy has also been discussed by Gordon et al. (in press-a). These external factors might be related to the athlete's personal life (e. g., social support, financial worries, social restrictions), but also might lie within the realm of the therapist-athlete relationship. Two anecdotes illustrating the importance of the relationship between the health professional and an injured athlete aptly conveys the point.

In the first example, an athlete told me once of how a renowned orthopedic physician was talking soothingly to him, as the athlete was laying on the operating table, just before the athlete's knee operation. Patting the athlete's left knee which apparently was about to be 'prepped' (prepared for surgery), the doctor told the athlete that the knee would be as good as new after the operation. The athlete replied "It bloody well better be, it's the right knee that needs operating on!"

In a similar vein, another athlete who was seeing a physiotherapist for a back problem said that his physiotherapist had calmly stated that "backs were not his specialty." The athlete, not wishing to be seen as being a 'difficult patient', and trusting the physiotherapist's skills, adhered to this therapist's program. A month later this athlete was able to see a back specialist who told him that the original physiotherapist's treatment plan may have harmed the athlete more than helped him.

One can't help wondering how these kind of episodes affect an athlete's confidence in the medical profession and the subsequent rehabilitation process. For example, harbored resentment towards health professionals who are not perceived by the athlete as helping him or her recover from their injury is a frequently cited source of anger in injured athletes (Dr. D. C. Reid, Personal Communication). Interestingly enough, the athlete described in the previous paragraph

never fully recovered from the knee operation, had to have further surgery, and constantly expressed ennui at the medical profession, in general, and his orthopedic specialist in particular.

Danish (1986) and Nideffer (1983) presented some useful information on factors affecting client-physician interactions, including sensitivity to the athletes' concerns and reactions to injury, establishing a trusting relationship (e. g., limits of confidentiality with coaching staff), providing support, and teaching mental skills, or referring to a psychologist.

Thus, there appears to be no doubt that the process of rehabilitating sports injuries is both psychosocial and physiological in orientation. However, little research has been done on this topic. Following a summary of the interventions and issues cited above, is a discussion of the difficulties in conducting research into these issues.

Summary of Psychological Aspects of Rehabilitation

To summarize, there has been a great deal of literature written about the psychological aspects of rehabilitating sports injuries. However, issues related to this area appear to be the wide scope of influence of psychosocial factors, the lack of research data on interventions, uncertainty as to who should perform these interventions, and time restrictions related to such interventions.

Firstly, the area of psychosocial aspects of injury appears to be wide ranging in scope. Psychosocial factors do not just revolve around the individual athlete, but also affect and are affected by other significant people in the process such as therapists, physicians, coaches, peers, and family members, as well as the treatment environment. Thus, psychoeducational interventions should be aimed at all of these areas, not just the athlete.

Secondly, there appears to have been little research conducted in this area. "No specific research has been conducted to directly assess the coping skills of athletes and the application of these skills during athletic rehabilitation although several authors have suggested guidelines" (Smith et al., 1990, p. 358). Future research might focus on a number of areas including: examining the efficacy of cognitive-behavioral techniques in maintaining an athlete's emotional balance and facilitating healing, investigating inter- and intra-personal factors facilitating adherence to therapy, or research into the effectiveness of psychoeducational programs (e. g.,

teaching athletes about the psychosocial aspects of recovery) on making an athlete's experience of injury more manageable. "This remains a fruitful area of research" (Yaffe, 1986, p. 30).

Thirdly, who is qualified to intervene psychologically and who has the time? Some authors (e. g., Gordon, 1986; Pedersen, 1986) have suggested that the athletic trainer or physiotherapist can help an athlete to psychologically cope with her or his injury by conveying empathy, and/or developing active listening skills. Two issues appear to be relevant. First, who has the time? Many therapists seem to have many clients 'on the go' at one time and may not have the time to work out collaborative goals with each client, let alone listen to an athlete's 'story'. Second, who is qualified to practice such skills? Although psychologists do not have an exclusive right to practice active and empathetic listening, some authors (e. g., Gordon et al., in press-a) have noted that therapists should be familiar with different types of interventions (e. g., relaxation, behavior modification, and cognitive restructuring). Given therapists' reported ignorance of such techniques (Gordon et al., in press-a), the competence of therapists to give such interventions appears questionable. However, as yet there seem to be no guidelines as to what constitutes competence in this area. This should be an area for further discussion.

One response to the questions of, 'Who has the time?", and "Who is competent?", is that mental health professionals do. For example, Smith et al. (1990) noted that a nurse trained in counselling and sport psychology took care of psychological issues in sports-related injury. This type of approach, and the issues cited above, indicate the potential need for a psychologist or mental health professional to be available to injured athletes for consultation in terms of the psychosocial aspects of injury.

In summary, Danish (1986) and Gordon (1986) have both pressed for the medical profession to treat the person and not just the injury. Danish (1986) stated that, "dealing with the injury exclusively without an understanding of how the injury may impact the athlete's self-concept, future plans, and social roles may have a negative impact on the morale of the athlete and the rehabilitation process" (p. 346).

Given the need for research in this area, a discussion of the difficulties in such research follows.

Problems in Researching Psychological Interventions in Sports Injury

There appears to be little controlled, empirical research in the area of psychosocial interventions in sports injury rehabilitation. One reason for the lack of research in this area may be due to the problems inherent in conducting research in this area. Problems include the inability to compare different injuries, individual responses to injury, and subsequent rehabilitation, difficulty in controlling extraneous variables, and problems in differentiating the effects of psychological from physiological interventions. In response to these difficulties, I suggest that qualitative research methodologies may be useful in this area.

Firstly, due to the individual nature of injuries, it may be difficult to equate different cases of the same injury type. For example, two second degree ligament strains may be very different with respect to the location and extent of tissue damage. Therefore, forming matched treatment and control groups may be nearly impossible. Similarly, what outcome measures should a researcher use? Dr. Ron Smith of the University of Washington suggested looking at reductions in swelling (personal communication, Spring, 1989); however, this assumes that the initial levels of swelling and tissue damage were similar.

Secondly, individual responses to an injury may confound the results of research with the effectiveness of psychological interventions on healing injuries. For example, it was mentioned earlier that even though athletes may be physically rehabilitated, the athletes may not be mentally ready to compete. Rotella and Heyman (1986) addressed this point by suggesting that by virtue of medical advances, physical recovery is now achieved perhaps faster than an athlete's psychological readiness to compete and, thus, resistance to an early return to play might be found. However, no assessment devices have yet been developed to investigate 'psychological readiness' to return to sport. In fact, to my knowledge, no definition of this concept appears in the literature.

On the other hand, an athlete may wish to return to his/her sport too quickly. To do so, they may exaggerate their ability to return to their sport. Sanderson (1978) speculated that this might be a problem with extroverted sports participants. Thus, the individual meaning of the injury to the

athlete, or athletic participant, will have some effect on the individual's motivation to return to the sport, and this would probably complicate outcome measures.

A third difficulty in this type of research might be an inability to control the subject's day-to-day activities outside the treatment program. In fact, these activities may either help or hinder recovery. Likewise, as Rotella and Campbell (1983) stated, it is also difficult to separate the individual and interactive effects of psychological and physical interventions. Other variables, like the quality and effect of the coach, therapist, physician, and athlete relationship, may also be moderating variables.

As a result of these limitations on experimental research design, perhaps single subject research designs, or a systematic qualitative research design may be a more appropriate way to investigate this area initially.

Summary of the Cited Literature on Psychosocial Aspects of Athletic Injuries.

To date, three areas have been identified where psychological factors may be relevant to the area of sport's injuries. These three are: (a) the prediction of injury from personality and life-stress data, (b) the athlete's reaction to injury, and (c) rehabilitation after injury.

The cited literature has tended to support the contention that the role of psychological factors in athletic injuries is complex. However, there still appears to be a paucity of empirical data to support the importance of psychological factors in athletic injury. For example, the evidence supporting the prediction of injury from psychological variables is equivocal and data related to the role of psychological factors in rehabilitation is sparse. There appears to be more consistent findings on athlete's psychological responses to injury although the variables related to this have not been well investigated. Thus, further research is needed in this area.

For example, future investigations involving the athlete's response to, and rehabilitation from, injury should consider the meaning of physical activity to the athlete, the athlete's personality, the athlete's reasons for athletic participation, perceived and actual severity of the injury, coping abilities, level of competition, and degree of experience. For example, Crossman and Jamieson

(1985) found that more experienced and elite athletes perceived the severe of their injuries 'more accurately'.

Broad criticisms of past research on the predictions of injury (e. g., Crossman, 1986) have included the variance in the definitions of injury, small sample sizes, use of retroactive questionnaire data, the use of non sport-specific measures, and the emphasis on American Football as the main sport studied. Additionally, much of the data are anecdotal or speculative in nature. Where empirical research has been conducted, the results appear to be equivocal. Future research should take these criticisms into account.

Perhaps the main criticism of past research on the prediction of injury is the sporadic nature of the research, and the absence of an empirically derived theory or mechanism underlying the prediction of athletic injury from psychological data (e. g., Andersen & Williams, 1988), the athlete's psychological response to injury, or how an athlete should cope with the perceived stress of injury. Models appear to have been derived from non-athletic populations. A model based on the athletic population may give some insight into the special issues with which athletes might have to cope. For example, Crossman (1986), Gordon et al. (in press-a), and Nideffer (1983), have called for more research related to the psychosocial factors involved in the impact of, and recovery from athletic injury.

In the light of the complexity of this area and the lack of a theoretical base, an alternative approach which straddles both the anecdotal and more traditional research methodologies, may illuminate some previously opaque areas. The Grounded Theory method of qualitative research appears to be appropriate to investigate this complex area and develop a theoretical model of the psychosocial process(es) associated with sports injuries. This method was chosen as the research methodology for this study. The methodology of Grounded Theory and a short rational for its use is outlined in the next chapter.

Chapter Three

METHODOLOGY

In this chapter, the research methodology used for this study is described in detail. The format of this chapter is outlined in Table 4.

Table 4

Outline of the Research Methodology

The Choice of Approach
Rationale
The process of finding a process
Advantages and Limitations of Grounded Theory

Pre-Data Collection
Sources of Data
Ethical Considerations

Implementing Research
Criteria for Sampling of Participants
Recruiting the Participants
Description of the Participants
Description of the setting

Procedures
Data collection
Data Storage and Retrieval
Data Analysis
Criteria for Terminating Data Collection

Reliability and Validity
Assessing the Principal Researcher's Interview Style
Credibility or Truth Value
(includes validity check)

Applicability of Fittingness
Consistency or Auditability
Confirmability or Objectivity
Limitations
Delimitations
Description of researcher's suppositions

The Choice of Approach

In this section, a rationale for the use of grounded theory in this study is posited. Next, the grounded theory approach and the advantages and disadvantages of grounded theory are outlined. "Grounded Theory [sic] is based on the systematic generating of theory from data, that itself is systematically obtained from social research" (Glaser, 1978, p. 2). Thus, a theory is generated, or *emerges* from the available data, rather than the data "fitted" to a pre-existing theory. Current theories of the psychosocial aspects of sports injury have tended to be generated from pre-existing models from other areas (e. g., death and dying), and were not based on empirical research. I decided to use the grounded theory method to investigate this area, due to its ability to generate theory relevant to a particular substantive area, rather than applying pre-existing models which may or may not be appropriate.

It should be noted that there is a difference between formal and substantive theories. *Formal* theories are more general, or conceptually based, and might investigate the psychological processes associated with such generic concepts as health care or healing. A *substantive* theory is empirically based and related to a specific subset of a formal area. Thus, the substantive area under investigation in this study is that of the psychosocial process associated with moderate to severe athletic injuries (Glaser, 1978, p. 144). It was hoped that a *substantive* theory would emerge from the present study.

This section provides a brief overview of the central tenets of grounded theory and a rationale for the use of grounded theory as the research methodology for this study. The overview begins with a rationale for the use of grounded theory, followed by a description of the method including theoretical sampling, data collection and analysis, writing up the theory, criteria for evaluating a grounded theory, and the advantages and disadvantages of grounded theory.

Rationale

Grounded theory was used as the research methodology in this study due to: (a) the ability to use Grounded theory to generate theory in subject areas which are difficult to study with

traditional approaches and where there is a paucity of explanatory data, (b) its ability to describe generic processes underlying the phenomenon under study and, (c) its practical applicability.

Grounded theory is a qualitative research method which attempts "to create theory in subject areas that are difficult to access with traditional research methods" (Rennie, Phillips, & Quartaro, 1988, p. 140). Similarly, Quartaro (1986) stated that the grounded theory approach is particularly useful when "there may be some research in an area, but there are no good theories, and in particular, are no theories which are comprehensive explanations of all or most aspects of the phenomena in question" (p. 2). These criteria appeared to fit the research area of psychology as applied to sport injuries.

A further advantage of using grounded theory is its emphasis on discovering *Processes*. A process is a change that takes place over time; this involves the passage between at least two stages (Glaser, 1978). Bigus, Hadden, and Glaser (1979) described grounded theory as a research methodology which attempts to delineate *Basic Psychosocial Processes* (BPPs). These processes involve an interaction between psychological factors within the individual and the individual's social environment. BPPs are "conceptually developed to account for the organization of social behavior as it occurs over time" (Bigus et al., 1979, p. 251). The BPP is also known as the *Core Variable* "that accounts for the most variation in the data and to which other variables seem to be related." (Bigus et al., 1979, p. 263). Therefore a BPP is not a *static* description of a unit of study (e. g., the injured athlete), but is a rich dynamic description of an *active* process (e.g., recovering from injury). Thus, the BPP, or core variable, explains the variations that occur in the actions, interactions, perceptions, and interactional patterns found within the collected data from a research site. The BPP is, thus, a theoretical conceptualization of the emergent generic process, and can be applied to other sites and populations to test its *generalizability*. In this way, the conditions necessary for the properties and consequences of the process (e. g., recovering) can be delineated. The generalizability of a BPP can also be tested by the method of intersubjectivity. In this method, the generalizability of a theory is found by a reader's ability to apply the theory to his or her own situation. Thus, when an injured athlete reads

the theory which emerged from the present study, generalizability will have been reached if he or she says, "'That's the way it is", "That's right' " (Glaser, 1978, p. 13).

The theoretical aspect of the BPP does not preclude practical applications for the research findings. "Quite the contrary! Theoretical renderings in terms of BPPs contribute substantial insights into the practical realities of the day-to-day world by explaining its variation" (Bigus, et al., 1979, p. 267). Thus, grounded theory has both theoretical and practical relevance.

The Process of Finding a Process

This section gives a brief overview of the grounded theory method, including discussions of data collection, data analysis, generating a theory, criteria for evaluating a theory, and advantages and disadvantages of grounded theory.

Data Collection

The data for a grounded theory study can be collected from a variety of sources, and the participants are sampled through a method known as *theoretical sampling* (Charmaz, 1983; Strauss & Corbin, 1990). These are discussed below.

Data sources. Data sources for a grounded theory study can range from formal interviews, behavioral observations in the field, scientific literature, newspaper reports, etc. In fact, the concurrent use of literature to help explain and expand the theory is part of the unique approach of the grounded theory method. Interviews may be informal (e. g., a conversation) or formal (e. g., a scheduled interview in a private setting that is tape-recorded). Grounded theory interviews are typically of the formal type, and may initially be unstructured or open. This is to try to ensure that an investigator does not bias the theory by introducing preconceived concepts into the data too early. This type of interview will usually not have a formal set of questions to ask, except for an opening question such as "Could you tell me about your experience of being injured?". Typically, follow-up interviews with a participant may be more structured when the researcher is attempting to *densify* (i. e., get a thicker description) a category of data or the BPP (Bigus et al., 1979).

More structured interviews may be used later in the research in what is termed "secondary sampling." In this type of interview, participants who were not included in the initial data collection

might be asked to verify the theory. The participants might be asked such questions as: "Some people tell me that _____. Is this true for you?" (Morse, 1989, p. 117).

The grounded theory paradigm is based on a philosophy of *Symbolic Interactionism*. Thus, interpersonal interactions, behaviors, shared meanings, self-definitions of participants, and "the symbolic meaning that is transmitted via action" (Chenitz & Swanson, 1986, p.6) are the focus of investigation and the raw data to be collected. The raw data must reflect the meaning of an event gleaned from the participant's experience of the event, not the researcher's meaning. It is only later in the research process that the researcher adds his/her own insight in order to develop the concepts which underlie the participant's experience. Thus, the interactions of the participants with their world are derived from their interpretation of the meaning of the event (e. g., how one reacts to an athletic injury is based on the meaning that this event has to the individual, not what the researcher thinks it might mean from her/his own experience).

Theoretical sampling. Grounded theory combines inductive and deductive methodologies; this is known as *theoretical sampling*. In this method the data are concurrently analyzed and collected (Charmaz, 1983). For example, the results of the deductive phase give a researcher ideas as to who should be sampled next to glean more information to generate the theory (e. g., professional athletes, or re-interviewing a participant for further in-depth information). Induction (the inference of general law from specific instances) is used to build and expand the emerging theory. Thus, although the sampling process might start with a population that the researcher thinks represents the phenomenon under study, sampling will eventually broaden to test the generalizable limitations of the theory (Quartaro, 1986). For example, amateur-endurance event athletes might be the first participants that I may want to investigate if this emerging theory holds for professional-contact sport participants.

A further issue in theoretical sampling is that of finding a negative case. A negative case is a person who does not fit the theory. In this way, the theory can be delimited or, perhaps, expanded to include the negative case (Morse, 1989).

Data Analysis

The data are analyzed through a process of coding and *constant comparison*. The aim of the analysis is to find an underlying BPP, a central, high order category that explains the greatest amount of variation in the data as is possible. Data collection and analysis continue until *saturation* occurs and no new properties of a category emerge from the data.

As data are collected, their analysis progresses concurrently in order to give direction to the data collection process. Analysis begins with *coding* (or categorizing [Charmaz, 1983]) sentences, then paragraphs into distinct categories. Categories are then arranged in a hierarchical fashion, which become more general, abstract and inclusive as the hierarchy develops. In relation to this progression, Glaser (1978) discriminated between *substantive* coding and the more conceptual *theoretical* (hypothetical) coding. An example of substantive codes are the raw data from a study of a hospital which had been categorized into specific subject areas like social loss and attention (Glaser, 1978). Theoretical coding, then, aims to clarify the relationship between the substantive codes. In this example, attention and loss may be theoretically coded into a cause-effect relationship based on degree (e. g., the higher the social loss, the more attention received from the nurses). In order to do this type of analysis, Glaser (1978) suggested five rules for substantive coding. Firstly, the questions one must ask when coding substantively are "What is (sic) this data a study of?..What category does this incident indicate?.."What is actually happening in the data?" (p. 57). Secondly, analysis must be done line-by-line. The third rule is that one must make *memos* (notes to oneself) as soon as an idea or conceptual ordering of the data comes to mind; these are used in developing the theory. Fourthly, one must stay within one's substantive area. The final rule is to never assume the relevance of face sheet variables (e. g., gender, hair color, or race) unless this relevance emerges from the data.

Similarly, Glaser (1978) described 18 methods of developing theoretical coding, including such techniques as modelling, organizing substantive codes by type, or strategies, and temporal orderings. He also encouraged researchers to develop their own coding strategies. An important

point here is that investigators are likely to plan their research methods upon their interpretation of grounded theory, since Glaser and Strauss (1967) did not intend their methodology to represent a fixed standard.

A major component of the analysis of data is what has been termed *constant comparison* (Glaser, 1978). This technique involves the ongoing process of data collection and analysis which tends to occur in a recursive manner (Turner, 1981). During this recursive process, each datum (indicator) is compared to each other. As the investigator develops concepts and broader categories, each datum is compared to each conceptual (theoretical) code to see how they relate to each other. At a later stage, each conceptual code is compared to one another to assess the degree of overlap between them, or if categories can be collapsed into larger, more encompassing categories. Glaser (1978) explained further,

> From the comparisons of indicator to indicator the analyst is forced into confronting similarities, differences and degrees of consistency of meaning between indicators which generates an underlying uniformity which in turn results in a coded category and the beginning properties of it (Glaser, 1978, p. 62).

In this manner the constant comparative technique forms the link between the collected raw data, and the emerging theory.

The aim of this analysis is to work towards the development of a smaller number of higher order, more abstract categories. The eventual goal being a single *core category* which subsumes all the others and is, in fact, the theory (Chenitz & Swanson, 1986). The theory should illuminate a *process*. It is this methodology's emphasis on process that sets it apart from other qualitative research methods. For example, phenomenology (e. g., Giorgi, 1970) has emphasized a description of an individual's lived experience, as compared to the grounded theory researcher who conceptually interprets the data and develops a process. Grounded theory, therefore, seemed to be a useful method to answer my research question of "What psychological processes underlie optimal recovery from an athletic injury?".

Data collection and analysis continues until *saturation* of the categories occurs. This means that no more new categories emerge, and may occur in as few as 5-10 research protocols (Quartaro, 1986). However, limits of time, energy, and finances may be other realistic limitations to the process (Quartaro, 1986). In relation to this last point, due to the law of individual differences, it is debatable whether saturation can ever occur, since each new participant might add a new property to a category! This appears true of sports injuries, particularly in view of the large number different variables that can interact during an athlete's reaction to an injury.

Generating the Theory

Once saturation has occurred, the theory is written up. This is done using memos or research notes made during the research process, the data gleaned from the analysis, and extant literature. These memos are sorted and conceptual links between the categories are diagrammed. Quartaro (1986) stated that this is the part of the process which can be most limited by the researcher's knowledge or imagination.

Criteria for a Grounded Theory

Rennie, Phillips, and Quartaro (1988) explained that the resulting theory, grounded in the researcher's data (hence *grounded* theory), should meet the following four criteria:

1. It should appear plausible to the reader.
2. It should be comprehensive, and deal with all the presented data.
3. It should be inductively grounded in the data.
4. It should be applicable, and lead to further hypotheses and investigation.

Advantages and Limitations of the Grounded Theory Approach in Relation to this Study.

Advantages of Grounded Theory

Although not exhaustive, the research literature has identified a number of advantages of grounded theory. The advantages which are discussed in this section include, grounded theory's ability to explore difficult subject areas where relevant variables have not been identified, the fact that a large number of individuals can be sampled making the results more generalizable, its practical applicability to health care issues, its methodology enhances validity and reliability, and

that the theory is generated from the data and not vice-versa. The concepts of reliability and validity in grounded theory are introduced in this section, but are also described in more detail in the methodology section.

The advantages of grounded theory are:

1. It enables rigorous, systematic investigation of difficult subject areas (Quartaro, 1986). This aspect seems to be appropriate to the complex area of athletic injuries, particularly since little rigorous empirical data has been generated in this seemingly complex area.
2. It has been shown to be a useful technique in investigating areas where the relevant variables have not been identified (Stern, 1980). As noted in the literature review above, many of the relevant psychological variables involved in the rehabilitation of athletic injuries have yet to be empirically identified.
3. In the interests of achieving saturation, a larger number of individuals are investigated when compared to phenomenology. This can help to develop generalizability (Rennie, Phillips, & Quartaro, 1988, p.147). This feature was useful in the present study since a variety of different populations and contexts were investigated (e. g., amateur or professional athletes, competitive or recreational participants, time of season: mid-season or pre-play-offs, chronicity or severity of injury, etc.).
4. The theoretical sampling technique can aid in developing generalizability by looking at other populations and settings (Charmaz, 1983).
5. Health care system variables and their interaction with individual health care programs can be investigated (Chenitz & Swanson, 1986). This interaction was investigated in the context of a health care facility at the University of Alberta campus. Participant observation was also used to investigate this area.
6. The validity of a theory is enhanced by the process of theory revision in the light of disconfirming evidence (Kidder, 1981). Since the theory emerges concurrently with data collection, the internal validity (or 'Truth Value' [Guba, 1981]) of the theory can be checked or modified. Guba suggested that this can be expedited using prolonged engagement at the

site, persistent observation to identify typical and non-typical cases, peer debriefings with committee members or colleagues, and *Triangulation* (the use of multiple data sources). All of these methods were used in this study. For example, I was involved with the setting for four to six months in order to develop trust and to ascertain where biases may occur.

7. The theory fits the data and not vice-versa. This frees a researcher from the quantitative methodologist's problem of being restricted to having to disprove a certain theoretical position. Grounded theorists have postulated that having to disprove theoretical positions restricts discovery (Rennie, Phillips, & Quartaro, 1988). This is relevant to the area covered by the present study since little theory has been developed, and so there is the opportunity to generate a model from the research data.
8. Kidder (1981) and Guba (1981) argued that grounded theory can address the qualitative research methods demands of internal, external, and construct validity, quasi-experimental design, statistical conclusion validity, and reliability. Guba argued that the terminology used in quantitative (QNT) research is not relevant to the qualitative (QL) domain and developed a new terminology for the qualitative researcher to follow. Thus, internal validity (QNT) is termed *credibility* (QL): Can the participant recognize the phenomenon from a researcher's description of it? External validity (QNT) is termed *fittingness* (QL): How applicable are a researcher's findings to other settings? Reliability (QNT) is termed *auditability* (QL): Would our findings be consistently repeated if our study was done again under similar conditions? Objectivity (QNT) is called *confirmability* (QL): Do our results arise from a participant's responses or from the researcher's biases and motivations?

In terms of quasi-experimental designs, Kidder (1981) posited that by using retrospective data from the same subject, an inquirer can determine the conditions when a phenomena was present and when not. Thus, participants could be asked about different periods of the injury episode, and different psychological phenomena may be found that characterize different stages of the rehabilitation process.

Kidder (1981) also suggested that statistical conclusion validity (QNT) can be handled by the grounded theory method through the use of 'negative case analysis'. Thus, disconfirming data (negative cases) which arise during the grounded theory study can shape the emerging theory, as described in point number 6 described above. The negative cases can inform a researcher of conditions where the phenomena, or hypothesis, is violated and not present. In this way, error variance can be lessened.

9. The data for grounded theory are taken from real-life experience, and therefore avoids the lack of generalizability found in laboratory research. Thus, external validity is enhanced (Chenitz & Swanson, 1986). Since little empirical data appears to be present on the actual experience of athletes undergoing rehabilitation, this could be a major contribution to the literature in this area. The advantage of this approach is that I became informed of what actually happened in the rehabilitation process, rather than what should have happened (e. g., Crossman and Jamieson's [1985] study cited above). The specific ways of ensuring reliability and validity are discussed in the methodology section.
10. Grounded theories have practical application and add considerable understanding and control to the areas to which they are applied (Glaser, 1978).

Despite the benefits of grounded theory, there are some disadvantages to this method which are discussed next.

Disadvantages of Grounded Theory

Grounded theory has not been without its critics (e. g., Chenitz & Swanson, 1986; Layder, 1982). Quartaro (1986), however, has mentioned that these criticisms have tended to be more general than specific. Some of the arguments against grounded theory include its inability to account for contextual data, its philosophical underpinnings, its lack of validity and reliability from a quantitative research perspective, its inability to generate *formal* theories, and the use of subjective data. These are discussed in more detail below.

1. Layder (1982), in a constructive critique of this method, suggested that the emphasis of grounded theory on empirical (micro-level) data at the expense of theory testing can lead to an

exclusion of the global, contextual data which might shape an individual's behavior. However, Layder may have missed one major point in the method of grounded theory, and that is that grounded theory's theoretical sampling model attempts to delineate the contextual elements which define the category, or theory, itself. For example, in relation to athletic injury contextual variables might be investigated by observing or interviewing an athlete's family, teammates, coach or physician in order to gain an understanding of the external variables which might influence their behavior. Also, Layder appeared to ignore the deductive part of the method (e. g., testing of the theory in the theoretical sampling model), which indeed appears to be part of this method's strength.

2. Quartaro (1986) mentioned that the theory has been criticized on philosophical grounds. Apparently, some authors do not like the fact that it tends to straddle both positivistic (natural science) and qualitative approaches (e. g., Reason & Rowen, 1981). This appears to be a problem mainly for those individuals who adhere to a rigid dichotomy in research methods. Quartaro, on the other hand, posited that it is this ambiguity of grounded theory's philosophical position that is its strength. In fact, Quartaro felt that the middle-ground approach of grounded theory would be an advantage for those students working in University departments which do not condone more radical qualitative research methods.
3. One problem of criticizing qualitative research from the quantitative standpoint is that the concepts used in QNT (e. g., reliability and validity) may not translate to the concepts in QLT (e. g., credibility or auditability). Also, while accepting the validity of both qualitative and quantitative methodologies, Sandelowski (1986) cautioned that each method should be critiqued from within its own framework. Since each method approaches research differently, criticizing the qualitative perspective from a quantitative approach is meaningless. Thus, although grounded theory has aspects of both research approaches, attempts to ascertain 'reliability' and 'validity' in the present study were taken from current literature written specifically for grounded theory and qualitative research (e. g., Chenitz & Swanson, 1986; Guba, 1981;

Kidder, 1981; Sandelowski, 1986). The terminology used in this dissertation reflects this approach.

4. Chenitz and Swanson (1986) noted that grounded theory has been criticized on the grounds of lacking validity (termed *credibility*). For example, research results may be invalidated due to the subjective nature of the collected data (especially due to small sample sizes), the effect of the researcher on the data collection process, and historical events that might affect the phenomena. These authors encouraged the maintenance of detailed observations and memos in order to be aware of these factors. Participant-researcher relationships might also be a data source. Validity can also be found when similar conceptual patterns and experiences arise out of the data gleaned from each participant.

   Although it is often assumed that quantitative research is unbiased, this is not always the case. Quantitative researchers may covertly bias their data in a number of ways (e. g., choice of research questions, research instruments, methodologies, and data analysis) (see Giorgi, 1970). In qualitative research, however, the investigators overtly acknowledge their biases by a process called *bracketing*, a term used for the description of the researcher's experiences with the phenomenon under study, and expectations for the research outcomes (Giorgi, 1970). The researcher's recognition, acceptance and description of his/her own biases, is another way in which qualitative and quantitative research methods differ. The problem of researcher bias in the present study is addressed in a number of ways in the research, and these are discussed in the methods section under reliability and validity.

5. Reliability (*replicability*) might also be compromised with this method (Chenitz & Swanson, 1986). For example, an analysis of the same data by another researcher might result in a different theory. While acknowledging that this might be true, Chenitz and Swanson suggested that the reliability of a theory can be assessed in different ways. Thus, if we ask "will this theory allow us to interpret, understand and predict phenomena in a similar situation?", Chenitz and Swanson suggested we will answer "yes". Again, specific ways of enhancing reliability are discussed later in this chapter.

6. Quartaro (1986) noted that the grounded theory approach has not been so successful in formulating *formal* (more abstract and general) theories, which may be due to the fact that researchers are inexperienced since most studies are Ph. D. dissertations. Also, a lack of communication between researchers might limit the progression of many *substantive* (domain specific) theories being linked into more abstract formal theories. For example, the methodology of Glaser and Strauss (1967) has largely been passed on through word of mouth and may have lost substance in the telling. Lastly, it may be that grounded theory initially directed research efforts towards substantive theories, and its contributions to the literature or formal theory, by initiating ground-breaking research, may have been overlooked.

Hopefully this study will be the first in series of studies in the area of psychological factors in sports injuries. The information gleaned from this study is expected to form the basis for a theory and should generate questions for further research. With the publication of the research findings, further research and communication with other researchers in this area, the initial (substantive) theory may be made more formal. In an attempt to standardize the research approach, I paid close attention to publications describing grounded theory methodology (e. g., Chenitz & Swanson, 1986; Field & Morse, 1985; Glaser, 1978; Turner, 1981).

7. One final criticism shared by all qualitative research is that of the limitations of using a participant's verbal reports. Rennie, Phillips, and Quartaro (1988) cited authors who stated that the use of verbal reports as data often limits researchers to the conscious level of awareness and that the underlying processes may also be misrepresented. Layder (1982) tactfully suggested that few people seem to be totally aware of the motivations (internal or contextual) underlying their behavior. However, Rennie, Phillips, and Quartaro (1988) cited other authors who felt that our conscious thoughts reflect our intentionality, and that in-depth interviewing or video-taped analysis of sessions by the participant can aid in the accuracy of reported data.

In the present study, in order to gain the most valid information possible, the interviews were audio-taped. Debriefing sessions were held with the participant, in which they had the opportunity to clarify any questions that I had, and also validate the data and its analysis. In

addition, Quartaro (1986) stated that clinical training is invaluable to researchers, since they should be able to attend well to the information being provided and guide the interview. In fact, Quartaro stated that research and clinical interviews are similar. Thus, although I was somewhat inexperienced with grounded theory, I have had clinical training in counselling psychology which helped

me to guide the interview and allow the participants to fully discuss their experience of injury.

Grounded theory is not without its critics. However, in the area of sports injuries a unifying theory is needed and the subjective nature of the matter lends itself well to qualitative research. In addition, grounded theory appears to be a good method for delineating processes, particularly in the area of health care.

In answer to some of the criticisms in the literature, it appears that two other advantages of the method are the potential richness of the data produced and the systematicity of the approach. In summary, Kidder (1981) asserted that "Good qualitative research, like good quantitative research is both rich and rigorous" (p.254). Grounded theory appears to be able to meet both of these criteria.

Summary of Grounded Theory

Given the paucity of data and unifying theories on the psychological aspects of athletic injuries, grounded theory appears to be an appropriate research methodology to use for this study. In the next section, the research methodology used in this study is described in detail. In particular the issues of reliability, validity, and controlling for researcher bias are described.

Pre Data Collection

Before the data were collected in developing the research question, aspects of delineating the sources of data and ethical considerations were addressed. A research question guides the data collection, and its subsequent analysis (Glaser, 1978, p. 57). The research question for this study was finalized as, "What psychosocial processes (if any) are associated with a moderate to severe athletic injury?".

Sources of Data

A variety of data sources were used in order to glean information from the participants (also referred to as co-researchers) and then to validate these data. The sources of data that were used were formal unstructured and semi-structured interviews with the initial participants, informal interviews of secondary participants, field notes, demographic data forms, and extant literature.

Interviews

The interviews with injured athletes were primarily of the formal unstructured and semi-structured type. Swanson (1986) defined *formal* interviews as those which are performed in a private setting and which allow the collection of in-depth information. Swanson also differentiated between *structured* and *unstructured* formal interviews. Whereas structured interviews utilize a schedule of questions which are not deviated from, the unstructured interview allows more in-depth data to be collected in the participant's own words. Unstructured interviews are "the formal interviews used in grounded theory" (Swanson, 1986, p. 66). Thus, unstructured formal interviews were used with the injured sport participants. An example of an opening question of these types of the interview might be, "Can you please tell me about your experience of athletic injury?". During the initial interviews with each athlete, I attempted to follow Swanson's (1986) advice, which was to follow the participant's major concerns or viewpoints, without imposing my own sense of direction on the initial interviews. However, during the second interviews with participants one to five, and in the second half of the interviews with participants six and seven, the interviews became more structured. This approach allowed me to add depth to the categories by checking if certain information that did not appear in their original statements (e. g., a particular emotion endorsed by all the other participants) was omitted due to error (e. g., forgetting) or due to the fact that it was not part of their experience. An example of this type of question was as follows: "Some athletes have reported feeling angry after they have been injured. How does this fit with your experience?". This allowed the participant to agree or disagree, and then describe her or his experience related to that factor if appropriate.

Informal interviews (e. g., conversations) with therapists, athletes and physicians specializing in sports medicine occurred throughout the data collection period (ten months). These data were recorded in a journal where dated memos and personal notes were stored. These data also helped me to choose individuals who were knowledgeable in their field and willing to participate in the validation portion of the study.

Field Notes

Notes of field observations were also used as a source of data. These notes included observations noted during my own therapy experience and conversations with health professionals and committee members. These notes were logged in a research journal which was maintained for the duration of this study.

Demographic Data Form

In order to facilitate a 'thick' (in-depth) description of the co-researchers (also called participants), a demographic data sheet was developed to collect information on such variables as height, weight, primary sport participation, sporting and career goals, marital status, time spent in training during full-season and when injured, and family support. A copy of this data form is presented in Appendix A. The data form was developed with the assistance of the investigator's dissertation committee.

Literature

The existing literature on psychosocial aspects of athletic injuries, other injuries and illnesses, and addictions were used as data sources in the primary and secondary literature reviews. The primary literature review may have biased my approach to the research (e. g., the literature on grieving and loss). However, I attempted to keep the preliminary literature review as sparse as possible in order to keep possible biases at a minimum (Glaser & Straus, 1967). For example, many articles were collected during the data collection period, but were not read, and were placed in a drawer until the validation document was sent out to the validation sample.

Ethical Considerations

In order to conduct the research in an ethical manner an informed consent form was developed in conjunction with the dissertation committee and the department's Ethics Committee. The consent form included a description of and rationale for the study, the role of the co-researchers, potential risks and benefits of the study for the co-researcher, information on data storage, and limits to confidentiality (e. g., that the data will be presented in an anonymous way in any future publications). A copy of the informed consent form is presented in Appendix C. A version of the consent form was adapted for the validation sample (see validity section of this chapter) and is shown in Appendix B.

Implementing Research

The steps for implementing the research included the development of criteria for participants, and the recruitment of participants. A brief description of participants is included in the following section.

Criteria for Sampling of the Participants

The sample consisted of five participants whose data formed the basis for the theory which was generated from this study, two other injured athletes who were interviewed to assist in saturation of the BPP, and densification of the categories. The criteria which had to be met by the participants are discussed below.

It was assumed that there would be a greater psychological response by participants who had more severe athletic injuries. Therefore, to be eligible for the study, the participants (also termed co-researchers) were required to have incurred a moderate to severe athletic injury as defined by NAIRS. Thus, all participants had suffered an injury while participating in sport which required them to lose at least a week of active participation from the sport and to seek medical attention for that injury.

In addition to the injury criteria, the co-researchers had to be willing to participate in up to three interviews, and read transcripts and interpretive summaries of their interviews. Due to the verbal nature of interviews, and the principal researcher's linguistic limitations, participants were chosen

who could also express themselves verbally in English. In addition, athletes were chosen who had participated in competitive sport. This criteria is an arbitrary delimitation of the substantive area imposed by the principal researcher. The ability of the participant to meet these criteria was checked by telephone contact before data collection began. A final criteria was that the participants were not undergoing any psychotherapy at the time of the interviews.

Recruiting the Sample

The first three participants were approached by the principal researcher since they were known to fulfill the sampling criteria and were personal acquaintances who had expressed interest in participating in the study. They had also been treated at the Glen Sather Sports Medicine Clinic (also known as The Clinic). Participants four and five were recruited through a therapist at The Clinic. Participants six and seven were recruited via Dr. S. Gordon of the University of Western Australia, since Dr. Gordon knew that they fit my research criteria. I hoped that by including data from participants from another continent (i.e., Australia), possible negative cases could be investigated, and then a decision could be made to either delimit or expand the generalizability of the theory.

Description of the Sample and the Setting

A brief description of the sample and the setting follows.

Description of the Sample

In order to protect the anonymity of the participants, the seven injured athletes are briefly described below using pseudonyms, and are summarized in Table 5. This data was derived from the participant's interviews, and their answers to the demographic data sheet. This information is presented with the permission of the participants.

Table 5

Initial Sample of Injured Athletes

Participant	Age (Yrs.)	Gender	Sport	Injury
#1 (Grant)	19	Male	Triathlon	Ilio-Tibial Band Syndrome
#2 (Philip)	34	Male	Rugby Running	Chondromalacia Patella
#3 (Deborah)	28	Female	Triathlon Running	Undiagnosed - Hip
#4 (Ashley)	19	Female	Soccer	Anterior-Cruciate Repair
#5 (Terry)	28	Male	Canadian Football	Strained Knee Capsule
#6 (Bill)	20	Male	Australian Rules Football	Multiple-Severe
#7 (Julie)	24	Female	Netball	Knee - Cartilage

Grant

Grant was a 19 year old, single male. Grant was attending University in Alberta, Canada. His major sports included, triathlon, and road and track running. Grant said that he had Olympic ambitions in the triathlon, and another of his stated goals was to develop self-respect through sport.

The main injury Grant discussed occurred in 1989, and involved Ilio-Tibial band syndrome, a knee condition resulting from overuse. Grant initially noticed symptoms of the injury in July of 1989 (e. g. , knee discomfort), but he finally went into the doctor in September of 1989. The rehabilitation of the injury then lasted between one and a half, to two months. Although it was his general practitioner's advice to keep training, applying ice to the injury, doing stretching exercises, and to take anti-inflammatory medication, Grant said that he felt this treatment strategy probably made his injury worse. Eventually, he asked to see a specialist as a result of two incidents. The first involved two days of bed rest to alleviate his knee pain after a race, the second

was when he tried to bend down, but couldn't due to his knee pain. Grant was eventually given a diagnosis of Ilio-Tibial band syndrome. Grant stated that he was relieved at the diagnosis since it meant that it wasn't anything worse (e. g., cartilage damage). Grant started rehabilitation in the Clinic and returned to running after about six weeks of therapy. At the time of the first interview he had completely recovered from the Ilio-Tibial band syndrome, but was recovering from another injury (a calf strain).

Philip

Philip was a 34 year old male, married with one child. After graduating from his undergraduate program in physical education he taught physical education in a school for four years. He achieved a post-graduate level of education in physical education since then, and was seeking a faculty appointment. At the time of the interviews he was involved with a post-doctoral fellowship and sessional lecturing in a university in Canada.

Originally active in soccer, rugby and track and field, Philip then became involved in road-running (10 Kilometer road-racing). At the time of the interviews he was involved in teaching fitness classes, but no longer competed. His sporting ambitions were at the international level in running and later he confided that he had been thinking of re-activating his competitive running career at the Master's level (over 40 years of age).

Philip discussed a chronic knee injury which may have been initiated by congenital and developmental factors. For example, he said he received a series of acute athletic injuries to his knee over a period of eight years beginning when he was fifteen years old. The last injury was a rugby tackle where his knees "fell out" from under him, resulting in him being taken to hospital. His knee problems gradually became chronic, and so he went through a phase of managing the injury by exercising (running); this is when he became involved in road-racing. More recently, as the pain became more severe, Philip took to managing the pain by anti-inflammatories, physiotherapy and weight training. He has continued to run six times a week (twice a day - three days a week) with his fitness classes. Philip has decreased his volume of training, but increased his training speed since he said this does not bother his knee so much when he ran.

Deborah

Deborah was a 28 year old physiotherapist. She was married with no children. She has earned two undergraduate degrees from Universities in Canada. Deborah has competed in a number of sports including cross-country running and basketball at a university level, road running, cycling (road, track and trail), and most recently triathloning. Although she has described herself as "Miss Mediocrity", she also said she was still very competitive in her approach to sports.

Deborah injured her hip area while running a strenuous 10.9 mile leg in a local road relay. Initially thinking that it was a minor irritation she ran on, only to end the race in pain. Deborah classified the injury as an overuse injury although no official diagnosis was ever given. The injury continued to trouble her throughout the summer of 1988 despite taking physiotherapy treatment. The injury resulted in her reducing her running activity, and participating in triathlons. After the triathlon racing season was over Deborah decided to take six months away from running and she joined a swimming team to keep fit. After the lay-off she gradually returned to running, and was competing injury-free at the time of the first interview. However, by the third interview she was again injured (bursitis of the hip), and had sought medical treatment for this including anti-inflammatories, and a possible cortisone injection.

Ashley

Ashley was a 19 year, single, old female. At the time of the first interview she was in her second year of reading sciences at a university in Canada. She stated her sporting ambitions were to participate in National competitions (perhaps at a World level), and to coach at a National level.

At the time of her injury Ashley was involved in both ringette and soccer at both provincial and university levels, with the opportunity to go onto National trials. She missed out on this latter opportunity, and four championship finals when she tore the Anterior Cruciate ligament of her right knee during a game. There was no contact with another player when she injured herself, Ashley said that she just twisted her knee. Her injury required surgery and about nine months of

rehabilitation. During the research period Ashley was six to nine months post-operative and gradually returned to more activity; however, she was still not competing at soccer.

Terry

Terry was a 28 year old male, involved in professional football. Terry said he had played for several teams in the Canadian Football League. He received a college education in the United States of America. He was married with a young child. He equated his sport ambitions with experiencing life (i. e ., as a character builder, and a teacher of discipline and obedience).

Terry discussed two injuries. The most recent was a whiplash-type injury to his neck which resulted from another player forcing his head into the ground. This injury resulted in at least six months of therapy, but did not result in Terry missing any "play-off "games. Although he said this injury was 95% healed, he also said it still bothered him at times. Terry was still in therapy for this injury at the time of the first interview. At the time of the second interview he had returned to full-time training at his team's pre-season camp.

Terry mainly described a second injury which was his "worst ever injury". This injury resulted from trying to catch a ball during a game. An awkward fall resulted in a strain to the capsule of his right knee. The injury resulted in severe pain and disability for 14 games in the 1987 season. However, Terry said that he played through the injury as best he could. The injury gradually healed, and he said that his knee is now back to full strength.

Bill

Bill was a 20 year old male university student who had studied Human Movement at a university in Australia. Bill said that he has incurred a number of injuries as a result of playing semi-professional "Australian Rules" football. These injuries have included a stress fracture in his lumbar spine, four cervical spine fractures, and spinal shock (temporary numbing, and paralysis of muscles and the viscera) which resulted in him having to take 13 weeks out from play. Bill's most recent injury involved a torn Anterior Cruciate ligament, and strained Posterior Cruciate and Medial Collateral ligaments of his left knee sustained during a recreational soccer game. Treatment for this injury involved aspiration of the knee (draining off the fluid), immobilization, use of a

supporting hinged knee brace, and surgery at some future date. At the time of the interview he was not taking medications. Bill also noted that he has been advised to stop playing football altogether. He said that he now intended to be involved in coaching, playing other less dangerous sports (e. g. , golf), and keep in contact with football through scoring, and running information out to the players on the field.

Julie

Julie was a 24 year old, female, doctoral level student in Human Movement Studies at a university in Australia. She stated that she had been involved in a number of sporting activities including netball, basketball (in which she sustained knee injuries), and running steeplechase (in which she injured her ankle). She achieved a Grade A State (provincial) level of achievement in netball. Although Julie said that she had incurred 'repeated injuries' as a result of her involvement in sport, the most serious appeared to be torn cartilages (menisci in both right and left knees), Anterior Cruciate ligaments in her left knee, and lateral ligaments in her right ankle. These injuries were serious enough to curtail her competitive career. However, Julie also said that she may try playing competitively in netball again in the future.

Description of the Setting

Four research participants (Grant, Philip, Ashley and Terry) were recruited from the Glen Sather Sports Medicine Clinic, which is based in the Faculty of Physical Education and Recreation at the University of Alberta. The clinic is a multi-disciplinary center which offers teaching, treatment, and research opportunities in the field of athletic injuries. Treatment includes immediate injury assessment, contemporary sport rehabilitation techniques, physical reconditioning, and supportive strapping. Although minor injuries (e. g., blisters) are managed on a first-aid basis at the center, the majority of treatment is provided to musculoskeletal injuries which prevent participants from returning to pre-injury levels of physical activity.

The mandate of The Clinic is to rehabilitate participants back to their previous level of functioning, or to some form of alternate activity. The clinic deals with both *acute* and *chronic* (greater than six month duration) injuries. Clients range from the *recreational* participant to

professional and *international* level athletes. *Student* and *non-student* populations are treated, ranging in age from 6 to 80 yrs of age. On average, the clinic treats 50 clients per day in the summer and up to 100 clients per day in the fall. The average duration of treatment ranges from 3 to 6 weeks. Although the clinic does not use the NAIRS system, most injuries appear to be in the moderate to major range as defined by NAIRS. Thus, the population would provide the opportunity to sample a range of different injury types and participant groups.

The clinic is staffed by six physicians and five physiotherapists employed either on a full or part-time basis.

Four of the initial sample of seven had been treated at the Glen Sather Clinic (Grant, Philip, Deborah, and Ashley). Terry (a professional athlete) was recruited through a contact at The Clinic, since the football team to which he belonged possessed its own athletic training facility. Bill and Julie were recruited during a visit to Australia and, therefore, had no contact with The Clinic.

It should be noted that when grounded theory is used, data collection and analysis occur concurrently. Thus, selecting a sample, collecting data, and performing analysis on those data are done in a recursive fashion. A description of the data collection, analysis, and storage methods is delineated next.

Procedures

The procedures that were followed in this research project are described below. They included data collection, data storage and retrieval, and data analysis.

Data collection

The primary data source was from interviews with the participants. The interviews were conducted in comfortable and private settings (e. g., an office, or in the participant's home). It should be noted that I also incurred one major and one minor athletic injury during the data collection period; both of these injuries required medical attention and treatment at The Clinic. Thus, my own experiences with the injury process were noted in the research journal.

After completion of the informed consent and demographic data forms, initial participants participated in two in-depth interviews. These interviews lasted from 30 minutes to 105 minutes.

In some cases third interviews of approximately 10 minutes were conducted for a final confirmation, or explication, of the data. The initial interviews utilized an unstructured open-questioning format (e. g., "Please, could you tell me about your experience with injury?").

The second interviews were more structured, initially involved a discussion of the transcript of the first interview, and my interpretive summary of that interview. Both transcripts had been sent to the participant before the interview. Additionally, more specific questions were asked in relation to the data which appeared in other participants' accounts of their injury experience (e. g., "Other athletes have indicated that they became angry as a result of the injury. How does this fit with your experience?"). This latter procedure was conducted to check whether participants had forgotten some aspect of their experience (and therefore did not report it), or if they had just not experienced that phenomenon (e. g., angry feelings resulting from the injury).

The second and third interviews were, therefore, primarily done to achieve greater validity (Guba, 1981), and are known as a 'member checks'. Due to the great physical distance between Australia and Canada, the two Australian participants were only interviewed once. Their data were used to confirm and densify the theory, which was principally based on the first five (Canadian) participants.

Other data, in the form of answers to the validation questionnaires, were elicited from the validation sample after the first two interviews. This form of validation is known as triangulation. Both member checks and triangulation are described in more detail in the section on reliability and validity.

Data Storage and Retrieval.

The first two interviews for each were recorded on audio-tape and transcribed onto a Macintosh SE computer using Microsoft Word, Version 4.0 [1]word processing program. The audio-tapes, computer discs, printouts of the transcriptions, and questionnaire data were stored in a locked filing cabinet for security. These data were destroyed at the completion of this project (after the

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[1] Microsoft Word is a word processing package copyrighted by the Microsoft Corporation.

final Ph. D. Oral defence, and research articles were written). These data were stored on the computer discs to expedite analysis and retrieval of the information. The methods of data analysis are discussed next.

Data Analysis.

The data analysis procedure is briefly highlighted in Table 6, and described in more detail below. It should be noted that the process of analysis is recursive and not as linear as might be suggested by Table 6 (Turner, 1981).

Table 6

Summary of Data Collection and Analysis Process.

1. Collect initial interviews from Grant and Philip.
2. Analyze data using verbatim statements and substantive codes.
3. Collect initial interview from Deborah.
4. Code first three interviews. Collate codes into categories.
5. Collect data from Ashley,Terry, Bill and Julie.
6. More conceptual codes and categories emerge from the data.
7. Application of Glaser's (1978) theoretical codes based upon temporal sequencing of events, strategies to achieve states, and conditions to move through process. Define categories.
8. Develop model of phases based upon these data. Discovery of BPPs. Begin writing initial drafts of the theory.
9. Confirm theory with the initial sample by conducting second interviews.
10. Validate model and BPPs with validating sample.
11. Add additional evidence from the validating sample, and conduct third interviews with initial sample if necessary.
12. Decision to terminate data collection. Write up theory

An example of how one sentence was coded into two categories is given to help the reader understand this complex, and sometimes intuitive process. For example, Grant, Philip and Deborah's transcripts were initially overviewed and any predominant themes were noted (e. g., athletes used a number of strategies to combat pain). The transcripts were then coded on a sentence-by-sentence basis. Any sentences which appeared meaningful were highlighted and

designated as *meaning units*. For example, the sentence "adrenalin got me through the game" was highlighted, and the sentence "my sister is good at darts" was not. Each transcript generated up to 100 or more meaning units. These then had to be coded, collated and organized into larger and more encompassing categories.

A second level of coding (substantive coding) was then applied to the transcripts, here a code word (or code words) was attached to each meaning unit. Thus, the sentence "adrenalin got me through the game" was coded *Pain : Coping* in reference to the athlete's reference to adrenalin as a pain coping strategy. Later, a memo "Adrenalin allows an athlete to ignore pain and continue playing on an injury during a game" was written. In the spirit of *constant comparison* (Strauss & Corbin, 1990) each meaning unit was compared to each other meaning unit using questions such as: Do these meaning units refer to the same thing? Could they be coded together? If not, how could they be coded? How are these meaning units different? Each transcript was coded and re-coded on a sentence-by-sentence basis approximately three times. The important codes were kept, less important codes discarded or collapsed in with other categories. Each transcript and it's associated codes were then entered into the Factfinder[2] program. The Factfinder program allowed collation and organization of the transcripts and their associated codes. For example, the program allowed me to 'call up' all the meaning units that had been coded *Pain : Coping*. The Factfinder program therefore was valuable tool in accessing the data, but not analyzing it.

As other transcripts were coded and the data analysis proceeded, more codes were generated and larger categories became apparent, as did the need for more diverse categories. Thus, when the code *Pain : Coping* was applied to other transcripts, more examples of pain coping behaviors emerged (e. g. , ice, exercise, and medications). These examples were all then placed in a larger sub-category which was labelled *Managing the Physical Pain*. This category was so named since this label appeared to encapsulate the essence of the meaning units within it. *Managing the*

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[2] The Factfinder program is a data storage and retrieval system marketed by Factfinder Software, Inc., and MACWARE business products. There was no copyright protection on Version 1.1 of this program.

Physical Pain was itself subsumed by a more conceptual category *Healing the Body* since managing the pain appeared to be part of the healing process. *Healing the Body* itself became a sub-category under the major category *Phase Three - Dealing with the Impact* since healing the injury appeared to be a major aspect of dealing with the impact of the injury. As more transcripts were coded more codes emerged, and new categories were developed. New data added new properties to categories (e. g ., dissociation as a pain management strategy), or were used to develop new categories. For example, all the meaning units which referred to an athlete's motivation in therapy were collated into a new category labelled *Generating and Maintaining Motivation* which itself was included later under the category *Healing the Body*. As no more new properties of categories, or new categories, emerged saturation was assumed to be reached. The names for the major categories were developed intuitively, and were the names that best reflected the content of the categories.

At a later stage of coding it appeared that a second interpretation of "adrenalin took me through the game" could be that a pain coping strategy such as this may encourage athletes to deny the pain of their injury, and therefore not acknowledge that they were injured. As a result, the "adrenalin" phrase was compared with the inclusion criteria for the category *Variables Related to Acknowledging the Injury*. In essence these variables represented the conditions, consequences and contexts for phase two - *Acknowledging the Injury* . After comparing it with each phrase that composed this category, "adrenalin took me through the game" was also included.

Thus, data analysis proceeded by a general process of line-by-line coding, constantly comparing phrases and categories to see if they were different, or if they could be collapsed into the same category. In this manner more conceptual, all encompassing, categories were built in a hierarchical manner. Most of the categories, were developed by the end of the analysis of the transcripts of the first three participants. The data from the final four participants helped to either develop or collapse the categories as necessary to obtain saturation.

At this level of coding, a BPP had not emerged from the data. However, after a perusal of the data, it appeared logical to apply some of Glaser's (1978) theoretical coding strategies to the data. The coding strategies which were useful in organizing the data included, *modelling* and *temporally ordering* phases of the injury which appeared in the data. *Conditions* and *contexts* for each phase, and *interactions* between the phases of the model, were then described and diagrammed. *Strategies* for achieving certain ends were also described. A model of the process, named the "Risks model" was then developed with the help of my dissertation supervisor and feedback from the participants, the dissertation supervisory committee, a peer debriefing group, and the validating sample. In addition, the theory was refined with the help of two public seminars involving therapists, coaches, injured athletes, sport psychologists, and graduate students researching in the area of sports injuries at a university in Australia. This method of validation is known as *reflexivity*. The "Risks" model was then refined in the light of disconfirming data until it "fitted" the experience of the initial sample. For example, the model initially had five major phases, the fourth phase being *Returning to the Activity*. However, it appeared that this phase was part of phase three *Dealing with the Impact* and so they were collapsed into one category. The "Risks" model is described in considerable detail in chapter four.

During this process a BPP emerged from the data after I kept asking myself: "What is the bottom line here? What is going on here? What process underlies each of the phases in the "Risks" model?". The initial BPP appeared to be *Running the Risks*, since at each stage there appeared to be risks being taken. However, during the initial write-up of the results, a second BPP appeared from the data. This BPP was initially termed *Opening to Healing* since it appeared that the participants needed to accept the injury and the need for comprehensive rehabilitation in order for optimal healing to occur. This was later changed to *Opening to the Messages* since this acceptance required an openness to the messages of both the body and external sources such as coaches and physicians. It appeared that the Basic Psychosocial Process associated with an athletic injury was a combination of these two processes.

During the whole data collection and analysis phase, comprehensive memos were written in my research journal. By the end of the study, this journal was 300 pages long. The memos were used as data about the various categories, and to develop and write-up the theory.

The interested reader is referred to Chenitz and Swanson (1986); Glaser (1978); and Strauss and Corbin (1990) for further details on data analysis techniques for grounded theory.

Finally, as the processes became apparent and the theory emerged, a decision had to be made to terminate data collection. The criteria for this decision are described next.

Criteria for Terminating Data Collection.

Quartaro (1986) suggested various criteria for terminating a grounded theory study, including saturation of the categories, or the depletion of financial or personal resources. Four points related to these issues are discussed below.

Firstly, there seems to be some argument as to what constitutes saturation. Quartaro (1986) suggested that saturation occurs when no new *categories* (e. g., managing the pain) are present in the data. On the other hand Glaser (1978) defined saturation as occurring when no new *properties* of a category (e. g., types of pain management strategies) emerge from the data. Given individual differences, it is arguable if saturation, as defined by Glaser, can ever occur. To this end, Quartaro's (1986) criteria were used. Thus, saturation was presumed when no new categories appeared to be forthcoming after interviews with participants five, six and seven. This also fit with Quartaro's (1986) statement that saturation can occur in as few as five to ten protocols. Secondly, although a few new properties emerged from the validating sample (e. g., alternative types of healing strategies), these were few and did not appear to add any new aspects to the BPPs. Thirdly, there was strong support for the theory from both the initial sample and the validating sample (e. g., "Yes that's the way I experienced it"). Finally, financial and vocational pressures on the principal researcher were further indications of the need to terminate data collection and write up the theory.

Reliability and Validity of Data

A number of methods can be used to establish that the data and their analyses are reliable and valid. This is called "Establishing Trustworthiness"(Guba, 1981). The methods used for this purpose were developed from the concepts described by Guba (1981), Kidder (1981), and Sandelowski (1986). The methodology used to establish trustworthiness is briefly described below, and include checking the researcher's interview style, and ensuring credibility, consistency, applicability, and auditability.

Assessment of Principal Researcher's Interview Style

My interview style was assessed by my dissertation supervisor. This was done to examine my ability to conduct the interview with open questions without directing the interview from my own previous experience with injury. A transcript from the first participant's initial interview was read by my supervisor. Comments as to my interview style and notable data were added to the transcript. Since the interview appeared to be unbiased, it was used as data. I took note of the comments and used the suggestions when continuing with the data collection procedure. Other methods were used to ensure the trustworthiness of the data, the four main areas are described below.

Credibility or Truth Value.

In order for a theory to be valid it should represent the truth as to the participant's experience. The concept of credibility addresses the issue of whether the theory represents the truth as given by the participants, or is a function of the way the theory was investigated. Acceptable data should, therefore, be credible. Guba (1981) suggested the following five procedures for ensuring credibility. These are prolonged engagement, persistent contact, peer debriefings, triangulation, and member checks.

Prolonged engagement at the research setting and with the participants should help to develop trust and rapport with the participants. This should increase the likelihood of receiving true personal data. I was involved with the research setting for ten months, and had frequent contact with the participants and therapists. In addition, a record of my daily memos helped me become aware of my biases and presuppositions. These are discussed at the end of this section.

Persistent contact allowed a greater understanding of typical and non-typical aspects of the participants and the phenomenon of being injured. For this reason, all of the initial participants were contacted twice, some three times, to get a greater insight into the phenomenon and the consistency of their reports. Inconsistencies in reports were discussed with the participants and clarified.

Interaction with a *peer debriefing group* allowed me to receive feedback on my interpretation of the process, the credibility of the data, and my own biases. This was done with a group of three other doctoral students who were using grounded theory and who met regularly to share data and ideas with respect to their research. In addition, the data were also shared with the research supervisor and the committee members. Finally, I had the opportunity to share an initial version of the theory with health professionals, injured athletes, and researchers in this area via two seminar presentations at a university in Australia.

The fourth source of credibility included verification of the data by *member checks* (Guba, 1981) and is one of the most important methods for achieving credibility. Thus, the interview transcripts, interpretive summaries of the interviews, and the emerging theory were presented back to the initial participants (the members) to check for credibility, or degree of truth.

The fifth method for enhancing truth value is termed *triangulation*. Triangulation involves the use of many different data sources "to overcome the deficiencies and biases that stem from any single method" (Mitchell, 1986, p.19). Thus, the results should become more valid since they are not method bound. "No item of information ought to be accepted that cannot be verified from at least two sources" (Guba, 1981, p.85).

Mitchell (1986) delineated four types of triangulation. *Data triangulation* involves using different data sources, such as people or data collected at different times. *Investigator triangulation* involves more than one principal researcher or coder of the data. *Theoretical triangulation* involves comparing different theoretical perspectives related to a phenomenon (e. g., biological, psychological, or sociological), and these perspectives are chosen before the study is begun. Finally, *methodological triangulation* utilizes a number of different methods to investigate a

phenomenon such as open-ended interviews and questionnaires. The use of at least two of these methods is called *multiple triangulation.*

Data and methodological triangulation were used for this study. Data triangulation involved interviews collected at different times and from different people. Different methods were also used to collect the data; these included unstructured interviews, semi-structured interviews, observations, conversations, and a validation questionnaire. The validation questionnaire method is described next. Data from both sources are reported in the results chapter.

Obtaining Credibility by Use of the Validation Questionnaire.

Validation questionnaire. In order to facilitate validation of the theory, a validation questionnaire was developed to obtain feedback from people who were familiar with the area of sports injury. The validation questionnaire was developed from an abbreviated summary of the second draft of the results chapter of this dissertation. The data were presented in a format where these co-researchers could check boxes if they agreed with the statements and they could also add certain comments (e. g., agreements or disagreements) in the spaces provided. This format was used to formalize the validation feedback and also utilize the information to densify the categories. However, it should be noted that the primary research data obtained was from the athlete's experiences, not other people's (e. g., a coach) idea of what the information should be like. A copy of the validation questionnaire is shown in Appendix B.

Validating sample. The validation questionnaire was distributed to 10 people who were involved with sports injuries, either as athletes, physicians practising sports medicine, sports psychologists, coaches, or sports physiotherapists. These participants were known to have had appropriate experience in their field of expertise, and had expressed willingness to read the summary-questionnaire and give feedback based on their professional knowledge.

Description of the validation sample. A brief description of the validating sample is shown in Table 7. These data include participant number, gender, and profession or level of experience.

The next source of validity was to ensure the generalizability of the data. This is known as applicability, or fittingness.

Table 7

Characteristics of Validation Sample

Participant Number	Gender	Profession/Role	Educational Qualifications	Years Experience in Profession/ Sport
01	Female	Athlete (Triathlon)	University Education	4
02	Male	Athlete (Wrestling)	University Education	10
03	Female	Physiotherapist	B.Sc. (Physiotherapy) Level 111 -Sports Physiotherapy	7
04	Male	Physiotherapist	B. Sc. (Physiotherapy) Level 11 -Sports	5
05	Female	Coach- Soccer	Level 111 coach University/ National	10
06	Male	Psychologist (Sports interest)	Ph.D. (Psychology) C. Psych (Alberta)	22
07	Male	Psychologist (Sports Interest)	Ph. D. (Ed. Psychology) C. Psych (Alberta)	7 (as Psychologist) 30 (as Coach)
08	Male	Physician (Sports Interest)	B.Sc (Pharmacy) M.D.	6
09	Male	Physician	B.Sc, M.D., Canadian Association of Sports Medicine Certified	12
10	Male	Physician Physiotherapist	M.D., B.P. T.	16

Applicability or Fittingness

The external validity, or generalizability, of the theory was investigated using a concept called *applicability* or *fittingness* (Lincoln & Guba, 1985). The question asked was how does this study generalize to different populations? Generalizability of this study was enhanced by the theoretical sampling of divergent populations and settings. For example, injured athletes were represented from both the male and female segments of the population, North America and Australia, and contact (e. g., Canadian and Australian Football) and non-contact sports (e. g., running and triathlon). A variety of acute and overuse injuries were also sampled. A detailed, or "thick" (Guba, 1981) description of the interview data and context also aided in developing applicability to other settings (see chapter four).

As was mentioned earlier, generalizability in qualitative analysis can be given by the reader of a given study if they say 'Yes that's the way I experienced it. That's right". This type of generalizability was given by many of the validation sample who agreed with the description of the process.

Consistency or Auditability

The concept of consistency addresses the question "Would someone who is given the same data replicate my results, or at least agree with my interpretation of the data?". Consistent data should be replicable, or understandable to a reviewer or auditor of the researcher's data, analysis, and research memos. The auditor should be able to understand how the theory was formulated.

In order to assess the consistency of the study, certain steps were followed. For example, an *audit trail* was developed by keeping an adequate record of memos and process and analysis notes in my research journal. Although financial constraints prevented this step being formally taken, the audit trail for this study is available for perusal by an auditor. However, an informal audit was carried out by the committee members at various stages of the research. For example, a summary of the research findings were given to each dissertation committee member for comments. Similarly, the dissertation research supervisor was in a position to assess if the results

supported the theory and, on occasion, she noted that additional supporting data were needed to support a category or claim made in the theory.

Confirmability or Objectivity

Confirmability is exemplified by the question, "Are our findings a result of our respondent's data, or do they arise from the biases, motivations, and interests of the inquirer?" (Guba, 1981, p. 90).

The first step towards gaining confirmability or objectivity of the data was to recognize that the researcher's biases will affect the data. One way of doing this was to explicitly state the researcher's suppositions; these are described below. Another way that confirmability was achieved was by using triangulation (validation by multiple methods and data sources), and by practising reflexivity which involved making public statements of the research findings and describing the data which support those findings. As mentioned above this was done at peer debriefing meetings and public seminars. Thus, the theory was shown to be supported by the data.

In addition, a journal of introspections were kept in the research journal to detail research directions which were taken and why, and to describe the processes underlying category and concept development. Finally, a further independent *confirmability audit* using the audit trail can be carried out to confirm if the data found does in fact support the findings.

Summary

In summary, the above methods for determining whether the data were reliable and valid have satisfied Guba's (1981) minimum criteria for the trustworthiness of qualitative data of triangulation and member checks.

Limitations

The theory is limited in its generalizability by a number of factors. Firstly, only university educated participants were used. Different results may result when a less formally educated population is used. For example, blue collar workers may become involved in physical activity for

different reasons than their white collar counterparts, and this may mediate a different reaction to injury. Future research may investigate the further generalizability of the theory.

Secondly, only volunteer participants were used. These people may have personality characteristics different from non-volunteers.

Thirdly, the theory was generated from, and validated by seven participants. In the future, further validation can occur by publishing the results and receiving feedback from a larger audience.

Fourthly, the participants were only drawn from Edmonton, Alberta, Canada, and Perth, Western Australia. Sampling of other populations in the future will again challenge the generalizability of the findings.

Delimitations

The delimitations that I imposed included, firstly, investigating athletes who had been involved in competitive sports. Secondly, the injured athletes were the principal focus in this study; validation of their stories by interviewing family members or their therapist was not carried out. A third delimitation was the choice of the grounded theory research methodology.

Description of Researcher's Suppositions

In order to acknowledge my potential biases on this study, it was important for me to explicitly state my previous involvement with the phenomenon (see chapter one) and my preconceived suppositions as to the research outcome.

Firstly, I stated previously that I had incurred athletic injury before this study began, and then during the study. Secondly, although kept to a minimum, I had read research articles and publications related to psychosocial aspects of athletic injury. Thirdly, I had been trained in both physical education and counselling. This interaction of disciplines has led me to approach health problems from a mental and physical perspective.

These previous experiences led to me having the following presuppositions related to this study.

1. Recovering from injury is both a mental and physical process. It was expected that this outlook would be seen in the data and the emerging theory.
2. I did not totally agree with the "grieving and loss" models being applied to the area of athletic injury (e. g., Weiss & Troxell, 1986). Firstly, the labels of grieving and loss implied an understanding of an area that is not well documented. Secondly, the losses of athletic injury may only be temporary as compared to losses such as one's imminent death, or the death of a family member. Therefore, the applications of such models to the area of athletic injury may not be appropriate. Thirdly, although theoretically useful the use of the "grieving" models appear to be simplistic and do not seem to take into account the complexities of such phenomenon as grieving or responding to athletic injuries.
3. From my own experience with injury, I expected injured athletes to: exercise when injured even when they were not meant to, deny being injured, be afraid of putting on weight and losing fitness, and suffer from negative emotions such as anger, frustration, anxiety and depression. In addition I expected these athletes to experience uncertainty ranging from "When can I run again" to "Can I run again?". I also expected that the athletes would also react differently to different injuries depending on the context of the stage of their athletic career, immediate and life time sporting goals and severity of the injury.

Having described the methodology, the results of the study are presented in the next two chapters. Chapter four provides a brief overview of the process and chapter five provides a more in-depth description of the process and categories.

Chapter Four

OVERVIEW OF THE PROCESS

The process that emerged from the interviews with the participants is briefly described in this chapter. A more in depth description of each phase of the process and supporting quotes from the participants follows in chapter five.

In summary, two Basic Psychosocial Processes (BPP's) emerged from the data. These were *Running the Risks*, and *Opening to the Messages*. The model which emerged, hereafter referred to as the Risks Model, is shown in Figure 1. It includes the *Pre-Injury Context* followed by four phases labelled: *Getting Injured*, *Acknowledging the Injury*, *Dealing with the Impact of the Injury*, and *Achieving a Physical and Psychosocial Outcome*. In addition to these four phases, two categories called *Ignoring the Lessons*, and *Acting on the Lessons* are described. *Ignoring the Lessons* refers to the concept of relapse, whereas *Acting on the Lessons* refers to injury prevention strategies.

The Risks Model

Getting Injured (Phase 1) commonly occurred as the result of the *Pre-Injury Context*. This context involved internal factors such as the overuse of a body part, or a pre-existing injury, and/or external factors such as a collision with another player in a contact sport. Movement into *Acknowledging the Injury*, was characterized by the athlete making a choice along a continuum from denial to acceptance of the injury. The choice between denial and acceptance was bargaining. A variety of conditions such as persistent pain, or loss of the stability in a joint, encouraged acceptance of the injury and resulted in an *Impact*. In the third phase, *Dealing with the Impact*, the athlete adapted or adjusted to the physical, cognitive, behavioral, and emotional consequences of the injury. In fact, an athlete might have dealt with the impact of the injury by engaging in the bargaining-type behaviors which characterized phase two. This is indicated in the model by the bidirectional arrows between phases two and three. Typically, the athlete moved on to *Achieving a Physical and Psychosocial Outcome*. The outcome of the injury involved both psychological and physical aspects. For example, psychological outcomes included a

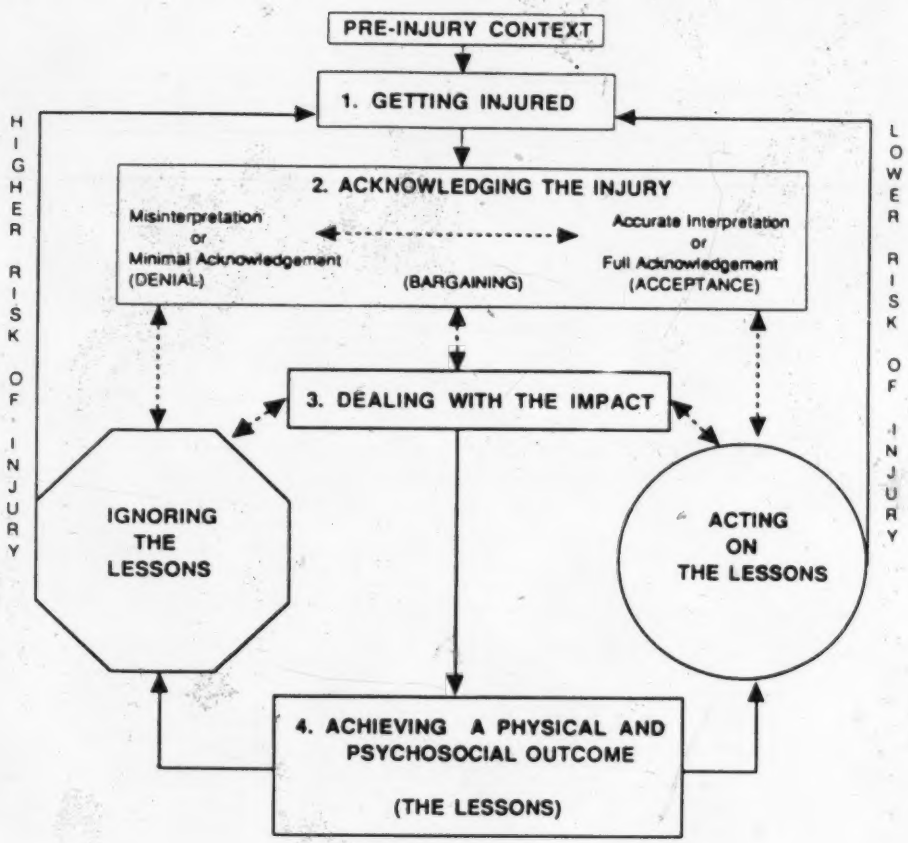

Figure 1. Running the Risks. A model of the psychosocial process associated with moderate to severe athletic injuries. Also referred to as *The Risks Model*.

re-evaluation of the importance of various lifestyle activities and learning about one's physical limitations. The learning that resulted from the experience of injury was termed *The Lessons*.

Physically, the outcome of a participant's injury lay somewhere along a continuum from full recovery and return to the sport/activity, through partial recovery and engaging in the injury activity at a reduced level, to participation in a new activity.

The category of relapse also emerged from the data and was called *Ignoring the Lessons*. This involved forgetting, or even deliberately ignoring the learning (if any) that occurred during the injury and rehabilitation process. Such lessons included the need to warm up or cut down the volume of training. Ignoring these lessons often placed the participant at a higher risk for injury and could have happened at any phase of the process, as indicated by the arrows. For example, the lessons may have been ignored during the injury acknowledgment phase if an athlete chose not to take heed of signals from the body, such as pain or discomfort and continued to exercise, thus exacerbating the injury. Similarly, when *Dealing with the Impact*, an athlete might have ignored the lessons by attempting to return to physical activity too soon, thus risking re-injury.

Evidence of learning the lessons was *Acting on the Lessons*. In this category the participants engaged in and complied with health behaviors which were aimed at reducing the likelihood of further injury. Such behaviors included: following warm-up routines or stretching before a work-out (e. g. , *Pre-Injury Context)*, adhering to a treatment regimen (e. g. , *Dealing with the Impact)*, or not waiting to seek medical advice once an injury was suspected (e. g. , *Acknowledging the Injury)*. Thus, *Acting on the Lessons* could occur at during any phase of the model, as indicated by the arrows. Hypothetically, by *Acting on the Lessons* an athlete might reduce the likelihood of getting re-injured.

Given the participants' reports of recurrent injury, it is possible that the cycle shown in Figure 1 may never be broken. The data indicated that by engaging in physical activity the participants exposed themselves to the risk of injury, which might be increased by *Ignoring the Lessons*, or decreased by *Acting on the Lessons*. The BPP of *Running the Risks* as it pertained to each

phase of the model is described next, followed by a description of a concurrent BPP *Opening to the Messages.*

Running the Risks - An Overview

One of the two basic psychosocial processes (BPP) that appeared from the data was *Running the Risks.* This BPP was a conceptual code generated from the data and was a major theme which accounted for a large amount of variance in the data at each phase in the model. The risk element appeared to be on a continuum of high to low risk. High risk thoughts and behaviors led to getting injured or exacerbating a pre-existing injury. Low risk behaviors and thoughts resulted in decreasing the chances of getting injured or making an acute injury chronic.

For example, in the first phase *(Getting Injured),* the participants ran the risk of injury by engaging in physical activity. In the second phase *(Acknowledging the Injury),* they ran an even further risk if they did not pay attention to the messages of the body, misinterpreted the body's messages, or denied the severity of the injury. Such appraisals resulted in delays in seeking treatment or partial compliance to therapy resulting in more physical damage. Acknowledgement by the participants of their injured state facilitated the participants in seeking appropriate help to heal their injury and reduced the risk of exacerbating it. In the third phase *(Dealing with the Impact)* risks were taken in bargaining-type behaviors such as attempting to re-enter the sport when not completely healed, or not being committed to adhering to their physiotherapist's rehabilitation plan (this is akin to *Ignoring the Lessons*). The participants who learned to adhere to their therapy, or properly manage their injury by reducing workloads and avoiding pain-eliciting activities, reduced the risk of exacerbating the injury and increased the chances for healing to occur.

In the fourth phase *(Achieving a Physical and Psychosocial Outcome),* taking risks involved *Ignoring the Lessons.* Not taking appropriate precautions, like wearing a cycling helmet in training, warming up before strenuous exercise, or partaking in stretching exercises to prevent injury, are typical of this behavior. In contrast, *Acting on the Lessons* helped reduce the risk of injury. Evidence for this were the reports of decreased injury occurrence or treatment duration by those who engaged in injury prevention activities.

In summary, risk-taking behaviors were found in all four phases of the Risks Model and, also, in the concepts of *acting on* and *ignoring the lessons*. It should be noted that the concept of *Running the Risks* was developed from an investigation of a number of different sports aside from running. Thus, it is expected that the Risks model will be applicable to athletes who are injured in a wide variety of sports such as ice-hockey, swimming etc. However, a second BPP, *Opening to the Messages*, also emerged from each phase and concept.

Opening to the Messages - A Brief Overview

Opening to the Messages was derived from the participants' data which showed that athletes needed to consciously or unconsciously listen to, or interpret, the messages being sent by the body or, indeed, by their health professionals. Some participants listened to the messages of the body, such as pain or muscle soreness and stiffness, or their coach (e. g., 'Take some time off')and *acted* on these messages by getting medical attention or resting. Others, or the same athletes at a different time, deliberately ignored or did not recognize the messages the body, or a health professional was sending them and they attempted to 'run through' the pain. This latter behavior often led to the injury becoming worse and prolonged the treatment duration. Thus, as above, opening to the messages could be conceptualized in terms of a continuum between listening to the messages, and not listening to (or ignoring) the messages.

Being closed to the messages was seen in phase one when prior to the injury the participants ignored fatigue (remain closed to the messages of the body) and, thus, predisposed themselves to injury. This can also be seen in the participants who trained or raced beyond their own present capacity.

In phase two, some participants denied the severity of the injury, thus remaining closed to the messages of the body. Others bargained with themselves or their health professionals by not adhering to treatment or resting during the week so that they could race at the weekend. In this way, they partially listened to the messages of the body, without respecting the severity of the injury. These participants appeared to be saying, "I am injured, but I won't fully accept the consequences of that injury." Once the participants listened to the messages their body, coach,

or health professional was sending them, they tended to adhere to therapy or completely stopped participating in the sport for a period of time in order to give the body the opportunity to heal.

In phase three, listening to the body was involved during the rehabilitation process. The messages of the body, such as pain or range of motion around a joint, were useful feedback devices informing the participants about their progress. In this phase, not listening to the messages led to *Ignoring the Lessons* , and relapse.

In phase four, not listening to the messages (*Ignoring the Lessons*) could lead to reinjury (e. g., by overtraining again). On the other hand, listening to the messages of the body (*Acting on the Lessons*), for example by getting immediate attention to injuries, could lead to injury prevention or a shortened rehabilitation duration.

Thus, *Opening to the Messages* appeared at all phases of the Risks Model, and was also found within the categories of *Ignoring, and Acting on the Lessons.* These phases and categories are described in further detail in the next chapter.

Chapter Five

AN IN-DEPTH DESCRIPTION OF THE 'RISKS' MODEL

In this chapter, the four phases of the Risks Model and the two additional categories of *Ignoring* and *Acting on the Lessons*, are described in detail. Verbatim quotes from the participants are used to support the various categories of data within each phase. The four phases of the process (1) *Getting Injured*, (2) *Acknowledging the Injury*, (3) *Dealing with the Impact of the Injury*, and (4) *Reaching a Physical and Psychological Outcome*, are described in order. Secondly, examples of the *Ignoring* and *Acting on the Lessons* are given. Finally, a brief report on the results of the validation process, and a description of the author's experience with injury are presented.

Phase One - Getting Injured

The participants reported injuries which were the result of *internal factors* in the athlete or *external* factors outside of an athlete's control. The categories are described in more detail below.

Internal Factors

Internal factors were deemed to lie within the responsibility of the athlete and/or related to the athlete's psychological make-up. Some participant's injuries were related to their attitudes towards sport participation. Variations of internal factors included:

(a) *Attempting to compete beyond one's physical capabilities;*

> I've always had one injury a year sort of thing...right after the racing season...I don't know if it's from over-racing or what...I probably didn't do enough preparation for that kind of workload ....my own stubbornness not to stretch has a little bit to do with it (Grant).

> I wasn't as fit coming into the next Jasper-Banff relay year, ...in '88 I wasn't as fit as I had been the year before. And I also took on a section that was way too much, I should have taken something that was very easy, instead I took on a long grinder section, with a long hill climb.and which wasn't a wise decision (Deborah).

(b) *An athlete's personality or perception of their own invincibility;*

> Well, I'm very competitive...there's something else that drives athletes to push and push and push a little bit overboard (Deborah).

> Before [the injury] I didn't think I really had a limit at all. If anybody asked me to do anything within a soccer game within reason, I would do it. Anybody who could challenge me on it, or who could give me a challenge like that I would get up for it, and go and do it (Ashley).

(c) *Ignoring over-fatigue, or the need to rest;*

> That was a good indication to me that, y'know, I'm getting tired of this. I need a little bit of a break. The injury came at a time where I really needed a break also mentally (Grant).

> I wasn't tired or anything like that..or though I had been playing for four teams at the time... Two ringette teams, and two soccer teams so that might have been a factor, my muscle fatigue...I don't know (Ashley).

(d) *Holding back;*

> What I'm trying to say is that I could have prevented that injury if I had have been free, totally free...I wouldn't have fallen that way, I wouldn't have slid on the turf that way, but there was something within me that was preventing me from going all the way, like I say I was still inhibited somewhat (Terry).

External Factors

Responsibility for the injury may also be external to the athlete. For example, a *chance or freak accident*, or *previous medical treatment* were perceived as responsible for an injury.

> Well, I thought it was a really freak accident. I'm not prone to injury at all. I mean I always think of myself as never getting injured (Ashley).

> When I was little I was always in that sticky plaster...I sprained my ankles...I blame the doctors for this, that what they did was atrophy, attenuate the development of my lower legs. I'm pretty sure it goes back to that point (Philip).

Summary

The participants described injuries that occurred under many conditions, some of which lay under the control of the athlete, others which they perceived were out of their control. Once the participants 'got injured', either by an overuse or acute cause, they moved into the second phase of the model, which was termed *Acknowledging the Injury*.

Phase Two - Acknowledging or Interpreting The Injury

In this phase the participants either took heed of, ignored, or misinterpreted the messages their body was sending to them about the injury. These messages usually came in the form of pain, muscular tightness, or discomfort.

Acknowledgement or interpretation of the injury varied in degrees between (a) immediately accepting the injury (*Full Acknowledgement or Acceptance*), (b) partially accepting the injury *(bargaining)*, or (c) not acknowledging the warning signs of injury and carrying on with the activity *(denial)*. This latter phase of misinterpretation, or denial, might last a few seconds or many months

or years. Factors related to movement through this stage were varied. The categories that supported this phase in the model are outlined in Table 8.

Table 8

Categories described in Phase 2 -Acknowledging the Injury

Fully Acknowledging the Injury
- Internal Messages from the Body
- Messengers External to the Body

Partially Acknowledging the Injury (Bargaining)

Not Acknowledging the Injury (Denial)

Variables Related to Acknowledging the Injury

Fully Acknowledging the Injury.

Although the timing differed from individual to individual, all the participants in this study eventually came to a *realization* that they were injured and needed to seek medical help for their condition.

> I realized finally, formally, that I had a chronic problem that wasn't going to go away, and I think then I became depressed a bit (Philip).

The participants became aware of being injured, or of the severity of their injury, by a number of *internal* and *external* messengers.

Internal Messages from the Body.

One of the most potent media through which the body communicates an injured state to us, is *pain*, and by physical evidence such as a bruise or joint instability. This is evidenced by the following statements:

> I remember playing seven-a-side (rugby) at the end of that term and I could hardly walk for about a month afterwards, just excruciating pain...then I was knew I was in trouble. I had a real problem (Philip).

> About a week after (the race), I thought my knees were better and I bent down, and I went to get back up. My knee just shot pain through my leg like I couldn't believe. I said 'this is crazy...enough is enough'(Grant).

> And then I turned and the knee just gave out and then I knew I was hurt in some way or another ..really hurt and felt sick right then. Then they took me to emergency...(Ashley).
>
> Because I could see it, I think that also had a little bit to do with me getting in there quickly. Because I saw it and said 'Wait a second, that's not normal. Where (with) tight Ilio-Tibial band, you can't really see it (Grant).
>
> (Julie) Eventually you resign, I suppose, to the fact that you're not going...back to the top level that you were.
> Researcher: What has to occur for that resignation to happen do you think?
> (Julie) A lot of setbacks, ...It was probably after my third time down that I realized something's not right. My leg is not built for this game.

Messengers External to the Body

One of the messengers of the severity of the problem can be the *medical profession.*

> I saw Dr. X. and he took one look at it and said it was Anterior Cruciate (Ashley).
>
> He (the general practitioner) said that it's probably I-T band syndrome, but because.I'm not.. (?) ..the pain had surrounded the whole knee he thought there might be also cartilage damage somewhere (Grant).
>
> The doctor said if you go to the United States to teach soccer you're going come back in a wheelchair. And I remember just thinking.!$#$%% you! (Philip)

Acknowledging the injury, seeking medical help, and adhering to a treatment regimen indicated that participants had accepted that they were injured, and had to do something about it. However, not all participants fully acknowledged that they were injured initially and either partially acknowledged the injury by attending therapy while they still continued their sport or simply did not believe they were injured.

Partially Acknowledging The Injury (Bargaining)

Complete adherence to therapy indicates full acceptance of the injury. However, partial acceptance of the injury, or *bargaining*, often involved behaviors including attending therapy or seeking medical advice, coupled with continuing with their physical activity (e. g., racing at weekends). This level of acceptance also appears to characterized by a temporary reduction in activity, followed by a premature resumption of the activity.

Bargaining appears to be closely related to denial and, in fact, may be a different type of denial. That is, the athlete is perhaps starting to become aware of his injury, but is not yet prepared to accept the impact. Bargaining is a risk that an athlete takes to offset the potential loss caused by

the injury, even at the risk of re-injury. Thus, bargaining is a way that an athlete attempts to ameliorate the impact of the injury, without having to temporarily or permanently lose their sport.

> It didn't really bother me when I was running...when I was on my bike I would get a really sharp pain on the outside (of the knee), where I would go a mile and have to run back...I wouldn't be able to do it. I went on doing that for, going that mile, turning back and mentally almost knowing that when I got to that mile I would have to turn back...and I'd say 'Ah..I'll just try to recover for the next race', and then after that race I'd try to recover for the next race, and I wasn't really doing anything about it (Grant).

> It still does give me some discomfort, but I guess it's a trade-off, like bargaining you know..."Well I won't do it because it hurts too much, but I want to do some because I feel good doing it"(Philip).

> I could do a triathlon, but then if I tried to run another day...I couldn't seem to put two days together...I guess was the bottom line. So I thought I could do it well enough just to get by on a triathlon, and take a week or two off of running, and do other stuff, and get back to it (Deborah).

> We play an 18 game regular season, so that meant 14 games, I was in terms of 1-100% I played those first 14 games at about 60 - 65% (Terry).

> Yeah you can pull a hamstring in a game and then say well I will watch it tonight and tomorrow morning and keep off it on Monday, and I won't train Monday night so I can play on Saturday...I suppose you are bargaining with yourself (Bill).

Some athletes did not heed their body's signals, and did not seek treatment.

<u>Not Acknowledging the Injury (Denial)</u>

In an attempt to keep going, many of the participants expressed that they deliberately ignored or misinterpreted the warning signs of injury. Behaving as if nothing had happened and delaying medical attention characterized this attitude of *denial*.

> As I was running I started to get sore, but it was probably..midnight and ... I kind of kept on going, and by the end of the section I was really sore ...Denial during the event. And then for a short while afterwards. I just thought "well this will go away" (Deborah).

> Well it's the typical attitude of a lot of...and I'm not the only one...runners and triathletes.."I'm not hurting, I'm not injured. I'm definitely like that....You are just denying it, there are days where you go, I wonder if I should go (to see the doctor), no I won't go...it will be better and you are always questioning, but you never go in because you don't want to admit it (Grant).

Coming to an awareness or an acknowledgement of the severity of the injury and passing through the phase of denial was affected by a number of different factors. These included:

(a) The athlete's *beliefs about the severity of the injury* and the perceived outcomes of being injured. Pain was used by the participants as a major cue by which to assess the *severity of an injury*. It was only when the pain continued or got worse, or that there was some physical evidence of the injury, that they *realized* the injury was more serious than they first thought. The greater the intensity or duration of the pain, or severity of the injury, the greater chance that the participant would realize that they were severely injured. An inability to accurately diagnose an injury or interpret the messages of the body also helped fuel the denial.

> I remember there was no real problem...I used to run home every night which was three miles,...I remember going back to my grandfather's and watching soccer on the T.V...and I went to get up and nothing happened. My knee was locked solid. By the next morning it was the size of a balloon (Philip).

> I didn't want to think I was injured. I just sort of hoped it would go away by the night. But by the next morning I couldn't move my leg so I knew I had to do something about it (Julie).

> But I just started to feel tight and I didn't think it would be much of anything going along, and if I had known what the repercussions would have been, there was no way that I would have kept going. I would have dropped out. I think if you had a spectacular crash or fall or whatever you're more inclined to do something about it. Where if it is something that comes on and it is a slightly more gradual process. You will put it off and I think it gradually gets worse. You tend to deny that it is getting worse (Deborah).

> ..I thought it wasn't really serious, maybe at the most some cartilage damage (Ashley).

> At the time I thought I must just be stretching a little more causing a little bit of ligament to probably rub on the knee...so I was content in taking the anti-inflammatories, and unfortunately I used the anti-inflammatories at one time to get through a race practically...the racing and training with anti-inflammatories might have caused the injury to get worse (Grant).

One variable that can affect the perception of severity of an injury is the individual's level of knowledge about his/her body.

> Sort of knowledge from the Physical Education side. You know what's happened with your body. It's just a matter of being smarter about what you are doing. You understand what the doctors say...I know the damage I can do. I mean having a torn Cruciate, I can tell you what that means. So I know the damage or the impact of that injury...But it's that line where you listen to your knowledge (Julie).

> During a conversation with a physician(Dr. Z), he suggested that from his recent experience denial can be countered by understanding what the potential consequences of an injury might be. He recently suffered two broken ribs. However, he still continued playing in a contact sport, convincing himself that "he was only bruised". After a physical and an X-ray, his own G.P. showed Dr. Z his two broken ribs. Faced with concrete evidence of his injury, Dr. Z now had to consider the potential consequences of playing with broken ribs (e. g., a punctured spleen). Although he continued playing, he avoided all forms of physical contact on the field, and only played half a game. This exemplifies the movement from denial to bargaining. (Journal Notes, September, 1990).

(b) Denial and bargaining were both encouraged by the *hope* that the problem would go away on its own, or that the medical profession would be able to fix any problems arising from the injury in the future. This hope then allowed the participant to continue exercising on an injured body part.

> Well, I think the hope, hope that it would be gone (Grant).

> Well, not believing that I would...would be really injured. Just sort of I didn't think..I think that I was just hoping that it would go away, and kind of the idea that you know "If I don't have to deal with it very much, then it'll probably clear up in a couple of days, and it'll just go away". And just put your head in the sand (chuckles), and the whole thing will just sort of go away (Deborah).

> I know or believe that my knees are going to be a real problem, when I'm about ten years older, but there's no point worrying about it right now. And...I obviously think that by that time you know technology will be so so..well maybe you can just replace them. So I guess I would go on with that hope (Philip).

The bargaining phase was also bolstered by the medical profession providing *hope* by giving optimistic diagnoses or by prescribing bargaining-type activities for therapy, perhaps even conflicting with an athlete's perception of the severity of the injury. On the other hand a negative perception of, or a lack of faith in a medical professional may not encourage hope and, in fact, encourage bargaining or denial.

> Oh Doctors say "Don't worry it will be OK", or "It doesn't look too bad on the arthroscope". And you'd go away and the pain would almost go away. It was a placebo. The pain would almost go away and of course it would come back (Philip).

> It was mainly because the physio didn't think it was an injury. You know, I thought it was something wrong. I knew there was something wrong, and he said "No it's just a strain". Sort of "get the inflammation down and it will be all right. It wasn't until after about three months he sent me to the doctor and he said it was torn cartilage...You sort of had to get back on the track because supposedly a professional told you there was nothing wrong (Julie).

> If I had gone in there and the physiotherapist said, 'Well I don't know, I don't want to honestly say", and was really wishy-washy about it, I would have probably gone out of there with a negative attitude about physiotherapy and probably would have tried to train through the injury...and probably wrecked myself even more where I would've had to go looking for help again (Grant).

(c) *Pain reducing strategies*, whether by using medications or mental techniques also helped participants continue to exercise through an injury:

> I felt good on the swim, good on the bike, a little twinge in my knee on the bike, but when I got off the bike and started running my knee felt good. Unfortunately I used the anti-inflammatories at one time to get through a race practically...the racing and training with anti-inflammatories might have caused the injury to get worse because I wasn't really feeling what was going on (Grant).

> When I was getting my training back...I thought "Oh I'm back, my knees are better now", but of course they weren't, I knew they weren't, but I'd learned to raise my pain threshold (Philip).

> Somehow, in the game, the Adrenalin took me through the game (Terry).

(d) *Attitudes* including stubbornness, resistance to medical prognoses, being competitive, and feeling invincible played a part in enhancing risk.

> My mum and I are very much alike, we're both very stubborn and especially when it comes to side-tracking our lives, and an injury does really side-track my life. You know it takes me off to another tangent from where I want to go. I'm not willing to admit it until I am positive I am injured (Grant).

> The doctor said if you go to the States to teach soccer you're going to come back in a wheelchair. And I remember just thinking $^%#@ you! I'm out of here, I don't care, and I went and started running again, and the thing started to improve. I was damned if somebody was going to tell me that I was going to be in a wheelchair at 25 years of age. I just wasn't going to accept that. So I said to hell with it, I'll cheat it (Philip).

> All through my athletic life I have been virtually unscathed, and I felt that I took it for granted in some respects...I know that's one of the reasons most of us athletes deteriorate so quickly because of the massive ego we believe we can go..go..go..go..go... non-stop and nothing ever happens and then three or four years later it's just a massive break down in the body, and that was happening to me, as I saw was happening to other athletes (Terry).

(e) All the participants said that they felt they were *addicted* to their sport. This aspect of being addicted to, or 'being hooked on', a sport or to training, appeared to underlie the unwillingness to give it up and, therefore, encouraged denial or bargaining-type behaviors.

> During the summer I was doing three workouts a day, so you get hooked on that, just like you get hooked on running...I got hooked on racing this year...and I'd say "Ah..I'll just try to recover for the next race", and then after that race I'd try to recover for the next race, and I wasn't really doing anything about it (Grant).

> I think that's what I had so much trouble with the past seven months. Especially because all my friends are in the sports that I play. Like I don't have very many friends outside of sports. Like definitely I live for sports, that's number one (Ashley).

> Well there's no question. I mean I was addicted to activity...when you present with an injury you can't quit (Philip).

(f) Finally, the *participant's age, stage of the season or one's career* encouraged denial of the injury or bargaining. For example, if the injury occurred near a big championship game or at the end of a Grand-Prix race series, an athlete might play or run through the injury to complete the competition.

> Recently one of the participants incurred an undiagnosable, yet still painful hip injury. Because she had one race left to finish a Grand-Prix series, she ran through the painful injury and even asked a physician for a cortisone shot to alleviate the pain. Her reasoning was that after she finished the race to get some points towards a $250.00 prize, she was going on holiday and could have three weeks off. This is a definitive example of bargaining. (Journal Notes - Aug/Sept 1990)

> I jarred a heel in the second last game (of the season) and it was essential for us to win the last game for us to get into the finals...I was desperate to play in the last game...I knew I was going to have this fitness test...and I knew I could grit my teeth for five minutes. I got through it, but then I paid the penalty for getting my neck cracked in the next game. That was the bargain (Bill).

Similarly, if an athlete feels that he or she has *not achieved their athletic goals*, they might deny their injury or bargain by returning from retirement and competing with an injury. This need to get back into competitive sport may fluctuate with time.

> You see it happening and you just want to be out there with the girls. I don't know probably because I've never really reached where I wanted to get to. I still think you can get back in there...It's just a matter of getting yourself back there and trying to make it I suppose. It's just, I don't know that I'm ready to retire...There are the risks now that I'm studying again - the risk to my career and that. It's not gonna matter if I end up on crutches..I went through a stage where I was happy to go for my rides and things like that, lately, it's just the need for that competition again (Julie).

> My husband...although he likes his sports, he's happily quit his competitive days, and he doesn't have much problem with that, whereas I'm not quite at that stage (Deborah).

> From my own experience with my back injury. I had nearly talked myself out of even thinking about running again. "Time to hang your shoes up", but then I thought, "No way, I still haven't broken 31 minutes for 10 km., I can't give it up yet. I'm going to do my damndest to get back" (Author, personal journal notes).

To summarize, after athletes became injured they described a continuum of acknowledgement of their injury ranging from denial to full acceptance. There were a number of different factors which influenced the participants' level of acknowledgement of an injury. Once the participants acknowledged that they were injured, they moved onto "Dealing with the Impact".

Phase Three - Dealing With The Impact Of The Injury.

An injury can affect various areas of an athlete's life, potentially including emotional well-being, school performance, and the athlete's relationships with significant others. The athlete then has to deal with this impact depending on the meaning that the impact of the injury has for him or her.

It became apparent to me that the process of dealing with the impact of the injury is *systemic*, and that each of the substantive categories which emerged from the data reciprocally affected the other.

The categories in this third phase, which emerged from the data, are shown in Table 9, and are described in more detail below.

Table 9

Substantive Categories Found Within Phase Three - Dealing With The Impact.

Experiencing Emotions
Dealing with Emotions
Reorganizing One's Lifestyle
Healing the Body
Changing Sense of Self
Interacting with Others

Experiencing Emotions.

A variety of emotions emerged as being a result of an injury and a number of methods, such as defense mechanisms, were used to alleviate this emotional impact. The emotions that were experienced and their sources are described first, followed by a description of some of the strategies used to deal with them.

The emotions that were experienced by the subjects arose from a number of different sources: (a) A number of different emotions were experienced in relation to *obstructed career and lifestyle goals*.

Anger resulted from being unable to go out and train, or the loss of a sport career and one's ability.

> ...being angry at not being able to go out and train (Grant).

> I feel cheated and angry and sad. I think it [the injury] deprived me definitely of elite level...I have to be careful and moderate those feelings else I get very angry. It's diminishing all the time (Philip).

> ...I was so angry then because I was like...you know the play-off, the game is coming up, the play-off game...you know now I am going to play at less than my best (Terry).

Frustration occurred as a result of the injury obstructing a participant from maintaining fitness and preventing him or her from competing. Frustration also resulted from the injury stopping participants from training in the summer, traditionally the best season for training for certain events.

> Pure frustration...I was in the fittest shape of my life...and then to come back and have to stop after a mile and turn back because your leg is hurting (Grant).

> Frustration...I don't know, and like sometimes tears will come to your eyes, because you wish that you were playing,...and because there is nothing that you can do about it..you know that, but it doesn't make it feel better (Ashley).

> It was pure frustration, I think, that's what it is. I think especially in the summer time. I could handle an injury a lot better in November (Deborah).

Disappointment and *sadness* also emerged as feelings experienced by the participants. These feelings were a consequence of being unable to achieve one's potential, feeling unfit, being unable to participate in important games, or maintain the fitness that had been developed during the pre-season.

> Very sad, that maybe I can't achieve, because I knew that I could have achieved possibly junior international status in running for sure...(Philip)

> I think I get very depressed. I find it very depressing. ...When I mentioned last summer, how I didn't feel fit enough to compete, and I know I periodically would get very depressed (Deborah).

> I think if I would have been on the field and won, I would have been crying...'cos the previous year we won Westerns, in a last minute goal, and I was crying then (whispers..can't hear it), but also 'cause I wasn't a part of it (Ashley).

> There is a down side to injury too, it's disappointment..you know...it's with all the work..I've got to start building back to where I was. It's disappointing because of all that hard work I did to get to that level I couldn't maintain because of that injury (Grant).

Wishing that they could be participating in their sport, lead to feelings of *longing*.

> ...a lot of the time I was thinking "God I wish I could be out running" (Grant).

> almost hurt too (pause) you wish you'd be out there, contributing and having fun..when you are sitting (Ashley).
>
> Yes, not so much the playing, but just the getting out and running and being able to go out windsurfing at the beach, and so on. Just longing to run, that is probably a big one (Bill).

Not being able to take part in their chosen activity resulted in feelings of *loss*. The injury also resulted in participants re-evaluating the significance of their sport in their life. It appeared that the more significant the sport was to the participant, or the stage of the season when the injury occurred, the more severe the feelings of loss.

> It was an empty feeling...I didn't really even consider how much sport meant until that point, and I just thought that I had lost everything (Philip).
>
> It's just amazing how something that, an activity becomes...you realize how dominant it is in your life. You don't think it's..well you think well...you'd go for a run for half-an-hour, or an hour a day what's the big deal in terms of a twenty-four hour day, (sighs) but how it can become a pretty important hour in your day, if you don't have it. It's a big loss (Deborah).
>
> Well, when I injured myself I..I was missing a lot of important competition. I missed (rueful chuckle)..two soccer national championships with my club team and my varsity team... I was trying out for a World's Ringette team at the time, and according to the coach I would have made it. It just so happens that they won Worlds, and in a couple of weeks time I'll be missing a..ringette nationals..so (her voice is trembling a little at this point). So I was missing quite a bit...(Ashley)

However, the emotions associated with the change in lifestyle resulting from the injury were not all bad.

> (I) would go to the mountains and I could do something there, mountain bike there. In a lot of ways I see it as a blessing in disguise, because I now am too selfish to spend every single weekend waiting for the race at the end of the weekend, be it triathlon, running or whatever. So..maybe that's more an indication of my age than of the injury, but the timing was good for me. That I was ready to accept to go do things like that (Deborah).

Other feelings that had to be dealt with in this third phase resulted from interactions with the medical system and the rehabilitation process.

(b) Feelings also arose as a result of the *participant's interactions with the medical system and the rehabilitation process*, which included: *Anger* and *Frustration* which resulted from interactions with health care professionals. For example, when medical records were misplaced, anger resulted from the delay in the rehabilitation process, and from not being party to the information.

> Anger, definite anger because it was like ...I was going nuts, because this guy knew what was wrong with me, and he wasn't going to tell me (Grant).

Anger also resulted from an athlete's perception of his/her physician's attitude, and interaction or communication style

> (I) wanted to punch the guy right in the teeth. I felt like breaking his jaw, I couldn't believe the apparent lack of concern that pervaded his attitude (Philip).

> I think [that] having the degree of medical knowledge that I do it's very frustrating to sit through that. You almost feel like "Hey come on give us a break, you know I know what's going on here. Don't keep using big terms that you don't think I understand" (Philip).

Not knowing the outcome of surgery resulted in *fear* and *uncertainty*;

> What I feared most of all, Jeremy, was the surgery itself...That's what I feared the most. You know, of the surgery, and if I would come back and to...I always felt that I would come back from the surgery, but to what degree? To what degree? (Terry)

> (Ashley) It scared me. Surgery, even though it's a minor surgery, it scared me. And then he explained it to me at the hospital, that they would go in and check my knee out, and if it was really bad enough, under the same anesthetic ...he would sew it back up. ... the operation. So when I went in, I didn't know if I would wake up with a brace on or just laying in bed or whatever..
> Researcher: And how did that affect you..
> (Ashley) A little worried, not knowing what to expect.

Failing to perceive that they were recovering from their injury, generated *discouragement*.

> It wouldn't improve very much and to stretch and to go through all this pain, and then not have hardly any results from it was very discouraging. You felt like...just letting it heal on its own (Ashley).

> Until that point I was still feeling down because recovery hadn't even started...where I could look at it as recovery (Grant).

Guilt and *remorse*, as a result of not being able to compete, added to the emotional impact.

> Literally I would be feeling guilty for not going in it (a triathlon), and kind of letting half of me down for not going in it (Deborah).

Guilt was also experienced if rehabilitation sessions were missed.

> Sometimes I say "well, I'm not going to do it right then..I'll do it later, whatever..", and sometimes I do skip it, and after I do it, I feel guilty, very guilty, because I know, if I keep skipping it's going to take me longer to recover, it's worse for me and so on like that. I made myself feel bad for it (Ashley).

Receiving a negative prognosis, or seeing the consequences of the medical intervention on one's body, resulted in *shock* or *disbelief*.

> Oh, doctors with their usual very subtle way of saying "Oh well Mr. X you're going to be in a wheelchair by the time you're 25.I. Never mind, goodbye..next!". That was the de rigeur(?) that was in my 2nd. year of University...I was shocked, absolutely shocked I couldn't believe it. And then of course then it was depression city (Philip).

> That was a shock, when they took off my brace for the first time, two weeks, I couldn't believe that was my leg, very shocking...and they take off the Jones wrapping, you got this skinny little leg with a big knee..it looked like I was from Ethiopia or something! It was very shocking, it almost brought tears to my eyes (Ashley).

Positive feelings were also experienced as a result of the *participants' interactions with the medical profession*, and from *re-engaging in exercise* again.

> one of the interns there..checked out my knee, and said it might be my meniscus, which if it is a minor tear in the meniscus it's only two weeks for healing...So it kind of got me up I thought, you know, "It's only two weeks that will be great!", as it turns out I woke up with my brace on my knee", (meaning she had had to have an operation)(Ashley).

> I kept wondering, 'When am I going to see the specialist?..When's my knee going to get better', there was some relief that finally something was getting done...I think there was a great weight lifted off my shoulders. At least..'OK recovery is going to start now'. That was a big, big, boost in morale", another boost to morale was when he said "No cartilage damage'..that meant I could get back training probably a month earlier than I had thought (Grant).

> Oh I can go harder and harder and I'm not getting any problems...It was a great feeling...(Deborah).

> Now I go out for a run and I just enjoy myself thoroughly, it's great (Grant).

Therefore, a number of feelings were described which resulted from a participant's interaction with the medical profession. Participants also reported their feelings towards the injury and its causes. These feelings included anger, disbelief, frustration, and helplessness.

(c) *Anger* or *hostility* were predominant feelings about an injury. These feelings were directed towards the person that caused the injury,

> It's really not anger. It's nobody's fault..though I'm really pissed off at the guy who initiated the real problem (Philip).

> My first initial feeling was to go out after the pain subsided somewhat, because I was in so much pain. Just to go out after this guy and take him out, man, take him out (Terry).

and the sport in which the participants were involved when they became injured.

> I was almost sort of mad at the sport of running, that it put me to this stage (Deborah).

Feelings of *disbelief* arose as a result of the realization of being injured:

> I wasn't frustrated, I wasn't disappointed..I was more in disbelief...(Grant).
>
> I didn't know whether to laugh or cry, as you can believe, but I knew that again I was injured. Disbelief I suppose. This isn't happening to me, not again. Here we go....(Bill)

Frustration and *helplessness* were experienced as a result of delays in healing and the physical limitations associated with the injury.

> I felt that I had taken time off. In my estimation I had taken ample time off. Like I was getting really very frustrated with that, and ...I felt that we should have been able to do more. It also lead to the question, "'Why can we not resolve what this is?'" (Deborah) .
>
> You are in this brace from here to here (shows whole leg) and they have got a Jones wrap, which is a cotton wrap around it, so you can't see your knee... you can feel it underneath, and the pain and sore and so forth. You are taking sponge baths and it's just amazing...and ...you can't do anything (Ashley).

In addition to the feelings associated with the injury and its rehabilitation, athletes noted certain emotions that occurred as a result of the effect of the injuries on their relationships with significant others.

(d) The participants noted that *other people treated them differently* when they were injured. These new interactions resulted in a number of feelings:

As a result of the injury, the participants mentioned that they felt *excluded* from the team and group, since they could not participate in the team's or group's activities. Thus, they felt as if they were not part of the 'in-group any' more.

> what was really bad was that I was completely left out of everything...my injury did not make me part of the team at all. In fact I was left out of everything (Philip).
>
> I didn't like being around teammates. It was..I felt left out, and it just hurt listening to them talk about any game, practices anything...I didn't feel like I was part of the team any more...So I felt all alone and left out (Ashley).
>
> You are not quite in touch with everything that is happening, and yeah that hurt....You are not part of the whole scene anymore and just go along to the game...and enjoy still being part of it to a certain extent, but not quite the inner sanctum where the players are (Bill).

A feeling of *inadequacy* was felt by some participants when the injury prevented them from performing at their previously high level of accomplishment.

...I felt so inadequate (Philip).

when I started coaching, I'm helping coach a soccer team and there were certain drills that I could not demonstrate and I wanted to and I couldn't. So there again I guess you feel inadequate when you can't do the same things that everybody else is doing. That's hard and that makes me feel that I'm that much lower than everybody else is (Ashley).

Some participants became *jealous* or *frustrated* when they saw other people participating in an activity in which the participant could not.

I'm very envious of that, but I have to be careful and moderate those feeling else I get very angry (Philip).

This participant also admitted to being jealous. I think so, of my friends...well first of all they are lucky that they are playing (Ashley).

It was so frustrating that they were able to go out and still do the Jasper-Banff relay time and again. I would be the one that would get injured (Deborah).

Feelings of being *misunderstood* resulted from other people treating them differently and appearing to not appreciate what the injured athlete was going through. The participants said that they felt others perceived them as being malingerers or just lazy.

It kind of bothers me because people say they understand, and then you look at them and they've never been injured. I mean if it was somebody else and I said "I understand", I wouldn't really.... There was one girl on the team who thinks I should be back by now and she told me so, and says I'm not doing anything to get back, and I <u>am</u> (Ashley).

I was sitting out all the time. I felt tremendously bad about that, and I think I was looked down on because of that. There was no question..People thought I was swinging the lead (Philip).

In addition to interactions with others, another source of feelings resulting from the impact of the injury was that of the uncertainty of the future.

(e) One major source of feelings was the perceived *uncertainty* of an injured athlete's future in the sport or not knowing what the injury was. A typical question appears to be, "When can I get back, and to what extent?". This uncertainty led to a variety of feelings in the participants, including frustration and feeling scared.

I was always thinking about my knee and when is it going to get better? And when can I get back into training?(Grant).

God this might be..One day I might not be able to walk (Philip).

The main thing that effected me mentally was...How long will I have to play like this? How long will I have to play like this? (Terry)

> I wasn't sure at that point if I would be ever able to get back to it (running) again...I was starting to think God..I may not ever be able to run again...it was pretty depressing. A problem I think with my injury too...was that we couldn't really get at it, I mean I think it would have been a little bit easier if we'd been able to stick a label on it. You know "we're treating a this" and you just say I have a sore hip (Deborah).

Not knowing what the injury was, or how long it was going to last, caused some participants to become *frustrated*.

> I think I walked into the office frustrated because of the injury and not knowing what it was (Grant).

> I was frustrated because I didn't really know if this really was it. Is this really it? Have I really got a chronic knee problem for life now? (Philip).

An ignorance of what was going on, related to the injury, led to the participants feeling *scared*. This *fear* arose from thoughts of not being able to compete again and even that one might re-injure the body part upon returning to the sport.

> I was scared. I was really scared, because I didn't know if I had done something that would keep me out of sport for ever. Because I had never experienced pain like that. I was so scared of what was going to happen (Grant).

> And then just that niggling fear that maybe it (his knee) was going to be permanently injured and I (would) always have a limp and never be able to run (Bill).

The *uncertainty* was also related to an athlete's fear of being re-injured or of letting the team down on the athlete's first game back.

> (Ashley): I tell myself, "you know you can always get injured again"... I mean I'm going to ask my knee for as much as I did before..I think it'll give it to me, I think.. I'll have to wait and see.:"...
> Researcher: So you are kind of protecting it in a way (Ashley: yeah), and scared of what? Scared of ..
> (Ashley): I guess, either hurting it or doing it again.

> (Bill): I was scared about the first game I played after my neck injury...before I went up and boy, oh boy, I had no nails left, I was going through packs of gum like it was going out of fashion...
> Researcher: What were you scared of? Doing it again?
> (Bill): Doing it again. Stuffing out in the field, fear of failure, fear of misplaced faith in you.

Thus, fear and uncertainty were experienced by the athlete in relation to her/his ability to perform, if and when the athlete returned to their sport.

Summary

The result of an athletic injury had a significant emotional impact upon the participants. All the participants reported experiencing emotions such as anger, frustration, helplessness, fear, guilt, and depression as a result of a variety of different circumstances.

An awareness of the emotional impact of an athletic injury is important for clinicians. Although some athletes may possess ways to deal with these emotions, others may feel overwhelmed by these emotions and need to be taught additional emotionally-focussed coping strategies. The strategies that some participants in the present study used to deal with the emotions are described below.

Dealing with the Emotions

Given that all participants experienced emotions as a result of their moderate to severe athletic injury, the focus now turns to, "How did these people manage their feelings?". Athletes varied in their awareness of specific ways of dealing with these emotions. Some were quite explicit as to the strategies they used, while others seemed quite unaware of their emotionally-focussed coping techniques. These strategies are briefly be described and included:

(a) *Listening to the messages of healing.* Once the participants began to acknowledge their body's messages of recovery, unpleasant feeling began to dissipate and/or be replaced by positive feelings.

> I started to feel a little bit rejuvenated about running. I started to think (gasp) maybe I can do it ! Because I thought I had lost that sport for good ...yeah a big sense of relief. Sort of like "I'm back"!"(Deborah).

> (Ashley): It feels good and to be running after 5 months of not running is helping me I think upstairs.
> Researcher: How does that help you?
> (Ashley): Just encouraging, it says OK fine, your knee is really improving, you're going to get back, 'cos there's always a doubt here and there.

> During recovery anger disappeared (Grant).

> I iced, I iced, I did all the exercises they gave me to do and every ounce of healing gave me the strength to go on and to have an outlook of positivism that one needs, especially for one's emotional health, going through a period where as I would put it, that was my worst injury (Terry).

> As I jogged I said "Hey..I feel OK, I'm..yeah I'm OK, that doesn't mean anything, I'm not going very hard, but I feel OK". So there was a sort of glimmer of hope,...It felt wonderful to run and feel fine when I ran, and fine after the race, and fine everyday afterwards. It was a great feeling..(Deborah).

(b) *Faith* in one's God, one's self, or in the 'foundation' of one's rehabilitation program, were said to have alleviated some of the more unpleasant emotions such as uncertainty or fear associated with a participant's injury .

> I've always grown up on faith, and faith is the substance of things hoped for, the evidence of things not seen, and I knew I could continue to keep playing like this (Terry).

> I really didn't have any doubt within my mind that I would be playing next season..I don't have really much qualms about my knee now either. People who have done it before tell me ..you know "Oh you know, you won't be playing for a while or this..be really leery about this, or really leery about that". I haven't, my knee feels really strong (Ashley).

> (Deborah): I was starting to think God..I may not ever be able to run again....
> Researcher: So what kept your hope going at that point?...
> (Deborah): I think I sort of kept in the back of my mind, that if I <u>really</u> gave it a full and true lay off, not ..you know not six weeks like, I mean a real, real lay off of months...

> The physiotherapist said "Well if you follow my program you'll be back running within a month". I knew I've got to follow this [program], and I'll be better and I'll be back running...If it had been...the situation where there was no foundation [the rehabilitation program] for me to follow, to grasp onto, try to reach for, I think the roller-coaster ride would have been a little more scary (Grant) .

(c) Some participants stated that in order to deal with some of the negative emotions associated with their injury, they would focus their minds on other things, engage in other activities or 'bury' thoughts about the injury and its meaning. Thus, in essence, the participants appeared to be *repriorizing* or *refocussing* their lives.

> To <u>manage</u> something like this you have to bury it, there's no question about that. Accept and just bury it and have done with it.... In fact I'm aware of some people who take some pretty drastic action upon their own selves i.e., suicide, because of the incredible depression that there is that they cannot be active anymore...So I gradually just pushed it down the list of conscious priorities, and give it very little thought. I've hardly given it any thought at all...It's diminishing all the time...family, house, other worries have taken over (Philip).

> So it wasn't perfectly satisfactory, but I wasn't going crazy. At least I was really able to pull myself into the other two activities [swimming and bicycling]. So I was lucky in that sense (Deborah).

> I am sort of coping with that [frustration] by using...my textbook skills to show younger kids how to do it, and how to do it right, and I get quite a bit of satisfaction out of that. So I am sort of trying to channel things away from getting focused on myself and trying to push things in different directions (Bill).

> I would try and forget about it, just to keep doing things, keep my mind occupied with other things, so I wouldn't think about it...that's kind of the way that I deal with painful things is just try not to think about it as long as I'm busy doing other things I don't think about it (Ashley).

This latter quote suggests that people may utilize ways of dealing with the injury that they have used in the past.

(d) *Receiving encouragement* from the self in the form of positive self-talk or from social support helped alleviate the emotional impact of injury.

> There were always down times, but then as soon as I started thinking that was when I'd say 'Forget this, we've got things to do. Lets go do it' (Grant).

> I'll smack myself sometimes. "Quit feeling sorry for yourself". I mean you are going to be walking and playing again eventually...there's people who can't walk and stuff. So I keep myself going that way too (Ashley).

> So it's going to be that will, that mind, and that spirit that's going to help you overcome this injury, because however you think - your body will react accordingly. I believe that I've experienced that. Just overcoming all of the adversity that I have in the past...The meditation, the deep meditation, the concentration, and the thinking, just the power of positive thinking that I have. I've always had it, but now I have it on audio. I talk to myself on tape, positive things, things that I want to do. I listen to that over and over and over (Terry).

> After I acknowledged the injury, really the only thing that got me through a lot of the emotions were my family and support from my friends. That was the biggest thing, but I by no means coped with the emotions well (Grant).

> ...I didn't feel like I was part of the team any more. And I did get lots of encouragement from players and the coach...definitely the coach helped me a lot (Ashley).

(e) *Coming to a resolution* as to one's temporary or permanent future role in the athletic world helped to alleviate the emotional impact of the injury.

> I'm resigned to it. There's not much that I can do about it. And I certainly know that I'm not going to spend the second...thirty years of my existence worrying about not being able to walk at sixty. I've got too much to live for for that. I'm not going to worry about it (Philip).

> You see for me the moment it happened I knew that was it. My footy career was over. So there was <u>not</u> sort of "How am I going to get back, I have to go through all this pain again and try not get back....The coach wanted me to be a runner..who runs down carrying messages from the coach to the players...It is better to do something than nothing at all (Bill).

> I just alienated myself from the team... withdrawal away from anything that would remind, or get me thinking about it (the injury and its impact) (Ashley).

(f) *Gaining experience:* The emotional impact of an injury can be alleviated by learning about the injury experience or even by academic knowledge. This has implications for educating athletes about the injury experience.

> I didn't know how to deal with it, I think... However, I know if I injured it again I'd heal faster, just because I would know how far to push it this time. Sometimes you don't know how far to push it? And you know when to trust it and when not to and stuff...(Ashley).

> I guess my academic background made me learn about the process I was experiencing and that made it very manageable (Philip).

Summary

A number of different strategies and circumstances helped the athletes in dealing with the negative emotions associated with their injuries. In addition to experiencing and dealing with emotions, a participant also had to adapt to the other effects that the impact of an injury had on his/her lifestyle. For example, the participants had to reorganize their lifestyles.

Re-organizing One's Lifestyle

Part of the process of dealing with the impact of an injury involved the injured athletes changing their lifestyles from one where sport absorbed a great deal of their time, to a life where participation in sport was not possible, or only possible at a reduced level.

> You've just got to fill up the hours that would otherwise have been spent with your sports doing something else. I have found that if I have got time to kill, I just sit around and think, and I think "Oh God here we go again", and you just feel yourself getting flatter and flatter [feeling down]. You have got to do something to pull yourself out of it..(Bill).

This adaptation of lifestyle also had other functions such as helping deal with emotions (e. g., by keeping one's mind off the impact), prevent further injury, allowing rest, minimizing fitness losses, or re-planning careers. The adaptation might be short term (e. g., for a week), but it also might also involve career changes which have resulted from a career-ending injury. Energy was redirected by:

(a) *Increasing time spent at school or work.*

> What I try to do... is try to put my efforts towards something else. Like when I was injured I really got keen on my schooling, and really studied harder than I'd ever done before so I could keep my mind off being angry at not being able to go out and train. It worked for a while, but you need running to give it a break (Grant).

> I usually play, so I don't like watching, and even in school I'm burying myself in my school work, and stuff (Ashley).

(b) *Resetting goals* resulted from the injury. This may have been an indirect result of the injury, for example, as a result of the decreased motivation which resulted from the injury:

> I just had no motivation..and (it) finally made me decide, to do what I had really been thinking about all along. I don't know why..why..it made me think that, or why it made me take that choice, but it just seemed to push me, to do that...(Ashley)

The injury might also prevent an athletic person from pursuing certain vocational or athletic goals.

> I had chosen a career in sport...Suddenly I was a Phys. Ed. teacher and all of a sudden the very things that I walked around on were quitting on me...If I am going to manage the problem, then I'm not going to have an open book on sport. Close the chapter the chapter is written it's finished. Now we're in Y's academic career, not his sport career (Philip).

The athletic goals for that season might also have to be changed to accommodate the injury.

> (My physiotherapist) just said 'Well look, you're just going to have to look at new things. Forget cross-country now, and lets start thinking about other things" (Grant).

(c) *Engaging in a reduced level of the activity* or in *alternate physical activities* such as swimming or cycling were strategies for maintaining fitness, dealing with emotions, and healing the body. These activities were ones which did not produce pain or which reduced the amount of injury-related activity.

> A walk-run program...got...my fitness level maintained. It didn't injure my knee because there wasn't this constant pounding (Grant).

> I started swimming again, but that was just a replacement...I was still able to compete at something even though it was with myself probably more than anything (Philip).

> You are trying to redirect where you are going to put all this energy. I'm not very comfortable at just sitting around, and saying "Oh well, I'm injured, I'm not going to do anything". I'm smart enough nowadays to know that...if I'm injured running I can't run, but I can certainly try to find something I can do, and do that... For example, swimming and eventually biking. I did lots of that, that summer. That was most of it mountain biking and road biking, and I could play tennis and I could play basketball... just to a limited degree (Deborah).

> It was a lot of bike riding. We started bike riding right off the bat, to get my mobility back first and then strengthening and endurance from their, and I'm still bike riding, and slowly got into some weight lifting and balancing and we used the brace (Ashley).

Therefore, the participants reorganized their goals and their physical activity patterns as a result of the injury. Another aspect of the lifestyle changes that had to be adapted to as a result of the injury were changing social activity patterns.

To summarize, as a result of a moderately severe to severe injury, the participants had to make some significant changes to their lifestyles. These lifestyle changes achieved a number of goals, including dealing with emotions, developing career options, minimizing fitness losses, and redirecting one's energy. A further aspect of dealing with the impact of an injury was that of the athletes' need to *Heal their bodies*.

Healing the Body

When dealing with the impact of an injury, a great deal of effort is directed towards healing the physical impact of the injury on the body. Following an acceptance or acknowledgment of the injury, the process of recovery began. The transition into this phase is a subjective perception, although there seems to be a time when recovery is perceived as beginning.

> Ok, recovery is going to start now...where up until that point I was still feeling down because recovery hadn't even started...where I could look at it as recovery (Grant).

Evidence of a number of strategies indicated that the participants were engaged in this phase. These strategies included:

(a) *Seeking medical advice:* Although the timing varied, all the participants sought some form of professional advice towards healing the injury.

> So what I first did is I went to Dr. X. (a local sports physician) (Grant).

> It happened on a Saturday, and that Monday I saw Dr. Z. and he took one look at it, (?) and said it was Anterior Cruciate (Ashley).

> And so I was treated a bit by physio, but we couldn't really sort out what it was (Deborah).

In doing so,the hope that the medical profession could "fix" the injury was a motivation.

> Stand up my son, you are healed. Yes that's what you want from a doctor. That's what I want from a doctor is for a doctor to say "No problem, we'll fix it. A little operation. You'll be as right as rain, no problems at all tomorrow. You'll be back playing sport. No problem at all". The last thing you want to hear is, "Well yeah you're right it's irreversible damage. So what are you going to do about it?". This is the crossroads. You're lying there thinking, "Shit, that's all I need. Thanks a lot. Thanks for nothing" (*laughs).* But one wants honesty though. So you feel a little pissed off that you are getting the truth (Philip).

However, this miracle cure hardly ever exists.

> I was most disappointed to hear the same thing everyone else had been saying. "It's going to take a long time, there's not much else we can do for you" (Author, personal journal notes).

A second opinion or a referral to a specialist was also sought if the participant was unsatisfied with the treatment he was getting.

> I forgot who it was, what doctor it was, but it wasn't my initial trainer...I think it was my chiropractor...he said that it was the capsule, I finally went and told the trainer about it, then he said "Oh! capsule, Oh! I know", and then he started putting me on a different type of treatment and then it all started coming together (Terry).

> He (a general practitioner) put me to a specialist...you know I was in with Dr. X (the specialist) and within about 30 seconds he knew what was wrong (Grant).

(b) *Attempting solutions*: The participants attempted a variety of solutions to facilitate the healing of the injury. These solutions may be initiated before or after visiting a health professional. These solutions may be more or less successful. The whole range of treatments available to athletes will not be presented here; however, some of the treatments described by the participants included: self-treatment, rest, surgery, and biofeedback.

Self-treatment included weight training or stretching exercises. A self-imposed *rest* period, or lay-off, was also another self-treatment strategy.

> There was no rehabilitation at all...I just weight trained and stuff like that (Philip).

> I thought it will be a week or so of lay-off and stretching and I'd be all right, but I couldn't seem to shake it. And so I was treated a bit by physiotherapy, but we couldn't really sort out what it was, and so I just started to resolve to the fact that I would just have to lay off, more than anything else. So we just..just took time off, and kept on hoping that it would go away (Deborah).

For some athletes, *surgery* was a possible alternative form of treatment.

> He said that I was going to go in for arthroscopic surgery on Tuesday (Ashley).

The decision to have surgery was placed in the hands of the athlete, often after being given the risks and benefits of a number of alternatives. This decision appeared to be influenced by various criteria including the severity of pain or degree of suffering caused by the injury, or the athlete's attitude towards surgery.

> My surgeon sat me down and explained the risks and alternatives of three possible alternatives to resolve my problem. Conservative therapy (a continuation of what had been going on for the past four-and-a half months, a Chymopapain injection or back surgery. I chose the injection because it seemed less invasive, gave me some hope for the future, and also left surgery as a last resort. (Author, personal journal notes)

> Oh, I'd have to be debilitated. I wouldn't be able to walk or I'd be in severe pain every step...about an eight (on a scale from 0 - no pain, to 10 - the most severe pain he had ever felt) (Philip).

> No I knew it wasn't strong enough to be a career ending injury then, but what I feared most of all, Jeremy,was the surgery itself (Terry).

Biofeedback was another healing modality, although in this case its efficacy was questionable.

> I went to the clinic and basically they just put me on some biofeedback type stuff...it didn't work worth a darn! (Philip).

Seeking medical advice and attempting solutions were strategies used to facilitate healing. However, the use of *inappropriate solutions* may have resulted in exacerbating some injuries by helping to silence the warning messages of the body (e. g., pain) and promoting bargaining-type behaviors, such as taking anti-inflammatories so that one could keep training. In these cases the solution became a problem.

> You know, in a sense, I think that's where he (Dr. X) screwed up a little bit....the racing and training with anti-inflammatories might have caused the injury to get worse, because I couldn't feel what was going on (Grant).

> I remember my physician at that time did the naughty of naughties...he was injecting pure cortisone straight into the joint on a weekly basis which of course caused further degenerative changes (Philip).

(c) *Protecting the self:* Another aspect of healing the body was to *protect* the injured body part from further damage. Self-protection was achieved in a number of ways. For example, resting or laying off from the activity appeared was one solution which resulted in self-protection, as was

reducing the amount of physical activity which was also noted in the category of re-organizing one's lifestyle. Two other methods of self-protection were (a) being extra careful when engaging in physical activity, or (b) using physical supports, such as a knee brace, to protect the injured body part. The use of these methods appeared to be motivated by a fear of reinjury.

> We did a lot of exercises with the brace on. I think I cover for myself too though. Like, whenever I jump off say the bench at ringette or whatever I always land on my left leg, just an automatic. Whereas, I should be thinking 'You've gotta land on both feet" and then eventually try landing on my right leg, but I'm still scared to do that (Ashley).

> I could hardly walk...I had to be very careful about anything that involved twisting, turning and bending, steep bending because of the knees this sort of thing (Philip).

(d) *Generating and maintaining motivation:* Once a therapeutic strategy was initiated, a major task for the injured athlete appeared to be *generating and maintaining the motivation* needed to adhere to the treatment program. Motivation appeared to be a problem since the athletes did not enjoy the types of activities used for treatment, and/or maintaining fitness.

> The mental thing though...the hardest thing I found was getting all geared up to go and do something and do a good workout and the <u>only</u> thing you could do was swim...the <u>only</u> thing you could do was swim, because biking and running were out by the end of it (Grant).

> It's really hard to motivate myself to work out sometimes too. Because, I mean, when you go to play soccer, whatever, there's a goal in mind to win. When you're on the bike, the motivation, there's always the motivation that you are going to get better, but it's tiring (Ashley).

> I guess I wasn't prepared to put the time in...and I guess in the end I got fed up sitting in the waiting room. Somebody's red tape really caused me problems <u>for sure</u>, I couldn't be bothered to wait around (Philip).

The participants reported a number of *strategies and events* that helped them to generate and maintain motivation. These included self-talk and reframing, improvements in function, the treatment environment, taking responsibility for treatment, and fearing the consequences of not adhering to therapy.

Self-talk and reframing (looking at a situation from a different perspective) was one strategy used to maintain the motivation to continue in this non-preferred activity.

> I kept trying to convince myself that it would do me good in the long run. I'm going to improve my swim time. It's the weakest link of the triathlon for me, and I kept saying "Well it's just improving your overall goal, and that's to develop..." (Grant).

> I see people in physiotherapy too that have ripped Anterior Cruciate and Medial Collateral and some cartilage, or you'll have people who've ripped two ligaments, and there's always encouragement that way. Like I'm lucky I've only ripped one ligament (Ashley).

Improvements in the athlete's function were signalled in a number of ways, such as the absence of pain, or increased range of motion. These messages of improvement from the body helped the individual to generate some motivation and hope.

> So I jogged in that (relay) and that was the first time that I had ever done any running at all (since the lay-off), and I mean it was dead, dead, dead slow... It was a totally non-competitive thing and that was the first time that as I jogged I said "Hey..I feel OK, I'm..yeah I'm OK, that doesn't mean anything I'm not going very hard, but I feel OK". So there was a sort of glimmer of hope (Deborah).

> There was a time about two months where I was doing the same exercises about every other day, and I didn't see much improvement, and then all of a sudden it like snapped..and I'm doing all these things that I want to do, and will soon be able to be starting to play, and so..very encouraging that way. Something to look forward to, 'cos it was very monotonous there for a while for about two months, three months (Ashley).

> So you sit there, and you're thinking while you are icing, while you are getting your 'sound treatments, and you have to draw on something, and the only thing you can draw on is the healing process. Any little bit. If I can straighten my leg out like this today , and tomorrow like that that's a big victory - two inches. That's a big victory (Terry).

The social nature of *the rehabilitation facility* helped the athlete comply with therapy.

> The one thing that did help was going to a sports medicine clinic, because you see other athletes in there...Being able to see people you could relate with...when you see other people working hard, trying to get better it sort of gives you a little added incentive saying. "Hey if they can...so can I" (Grant).

> If you know that you are not playing, you want to stay in the training room and be around people that are hurt like you. And that's because you feel like we have something in common. (Terry).

On the other hand, the nature of the facility might decrease adherence to a therapeutic program.

> It was just suddenly [that] the cooperation stopped for some reason. I just wasn't allowed to go in there. Whether or not they figured I was just working out for free, or not, I don't know. But I guess it's self treatment (Philip).

One of the main issues related to motivation for treatment, was for the injured athlete to *take responsibility* for the treatment.

> I guess the agreement is that I moderate my activity level, and we manage it as much as possible, and when it becomes unmanageable come back and see me sometime...he (the specialist) shifts the responsibility on me (Philip).

Fear of the consequences of not adhering to treatment was also a powerful motivator for the athlete to take responsibility for treatment.

> I did everything that I could control, because I believe in the rehabilitation sequence. The main thing you can do is do what you control. I mean the doctors are there to help you; however, just like in cancer patients and people who live past their time. It's all about will over skill. You know how much will you have. I know frankly that I didn't want to go to surgery. I didn't want to have surgery. I abhor surgery. So that meant I had to control what I could control, and I iced like three or four times a day. I was like the ice man cometh! (Terry).

> ...based on the rationale that I know that the alternative is severe atrophy in the surrounding musculature which is going to cause even more problems. So it certainly is a motivator as well as a management strategy (Philip).

(e) *Managing the physical pain:* In addition to the rigors of a treatment program, the *physical pain* associated with an injury was a major factor that the participants had to deal with.

> I remember playing seven-a-side (rugby) at the end of that term and I could hardly walk for about a month afterwards; just excruciating pain (Philip).

> The pain, Jerry, it was the worst pain that I have ever felt, just right in the back of my knee, I wasn't able to bend my leg. (Terry)

A a variety of methods were used to reduce the pain and suffering. These included rest, ice, psychological methods (e. g., competition adrenalin, or dissociation strategies), different sport techniques, exercise, and medications.

Icing and resting the injured body part were initial injury and pain management strategies.

> Well I iced and iced..I stayed around the pool side lying down and not moving very much, because I couldn't (Grant).

Mental strategies such as *dissociation*, in which the conscious mind is focussed onto subjects other than the pain, was another pain control strategy.

> I learned from a person in Guatemala once that what you do with pain is that you put it in a bottle and you stand it outside yourself. Or you stand outside yourself and the pain is trapped somewhere and you look at it, and you experience it, but it doesn't hurt (Philip).

The *adrenalin* associated with competition was another strategy used by athletes attempting to compete while injured.

> In the Victoria triathlon I managed to make it until it was only 100 meters or so to go, where my knees really hurt. By that time, you could still..adrenalin kicks in there and you can just run through it (Grant).

> However, during the week, like I said, I would get beat all week in practice and I couldn't run. It was like I was on one leg, but somehow in the game the adrenalin took me through...(Terry).

Exercising, or adapting exercise, technique were also used to manage pain.

> At first when they were letting me do that (resistance training) I was really getting somewhere. I was getting a real management of the pain. Tremendous. (Philip).

> I was doing everything. I was, I was playing with ideas. I was lifting my seat, dropping my handle bars, lifting my handle bars, dropping my seat. Trying to create different angles so that my knee wouldn't hurt (Grant).

Other participants used *medications* to decrease their pain levels.

> Learning to live with it meant taking anti-inflammatory drugs on a regular basis. Now...I've tried a few painkillers with Dr. X. (Philip).

> And for the, first I was in the hospital for four days, and the first two days I was pretty medicated (Ashley).

Although these *pain management strategies* had the advantage of controlling, or reducing the pain, they also had some drawbacks. For example, one problem with these strategies was that the natural warning signals of the body could be ignored, and as a result, the injury could be exacerbated by further activity.

> The racing and training with anti-inflammatories might have caused the injury to get worse, because I wasn't really feeling what was going on (Grant).

> The main danger is to realize that the damage is there, and that I can't go on playing, running and training like I used to (Philip).

(f) *Re-engaging in activity.* During the process of healing the body, the athletes tested out their injured limbs by doing various activities. They used the resulting messages of the body (e. g., pain, soreness, or absence of pain) as feedback concerning the extent of healing, and the athlete's readiness to return to physical activity. An absence of pain usually resulted in increasing activity. However, the presence of pain was a signal to 'back-off' and allow more healing to occur.

> As I said, your mind is in your knees. You're thinking about your knees all the time. Even when you are sitting down, you are straightening them, looking at them, clicking them, maybe it doesn't hurt. Yes it does (Philip).

> But then every once in a while I'd try to go for a little jog and ...it would be right there.."No can't do it. It's still there, we're obviously not getting at whatever the problem is" (Deborah).

> The second I feel a twinge in my knees, I'm going back to the walk-run program (Grant).

During rehabilitation there was a fine balance between exercising the body to facilitate healing, and overstressing the injury and causing a relapse. As a result, the messages of the body became an important source of information for both participant and therapist to gauge how much activity the participant could tolerate.

> I could feel it, I could feel it coming back. I can feel it coming back to the point where I could do more. My legs were stronger. I was performing better, because it is not how long you perform, it's how good you perform... So I brought my body along by feeling, by feeling it coming along, I brought it along and pushed it for as long as I could for as hard as I could, and then boom I got off the knee...(Terry).

> I think it would just say... a lot of it has to do with stiffness, I think, after I've been training and it's really stiff I know that I shouldn't have been pushing it quite that hard (Ashley).

If the recovery was successful, more and more activity could be tolerated and the athlete gradually re-engaged with his or her sport at some level. This return was usually gradual. However, the enthusiasm of returning to activity was also balanced against the *fear of re-injury*.

> I'd just do really short, you know, like 15 minute kind of runs, very slow..with tons of stretching before and afterwards and each time I'd think "I'm OK, I feel OK. I'm not and I don't feel sore tomorrow, or I'll take a day off tomorrow, and if I feel anything I'll stop, I'll stop, I swear I'll stop!" (Deborah).

> The beginning of November was when I started running again..I put in a 30 mile week and just increased it (Grant).

However, there was a need for some participants to *restrain* themselves since they were at a point where they could go back to their activity. The temptation was often to do too much activity, too soon. This could lead to relapse or imperfect healing. Premature re-engagement in a sport at too intense a level can also be encouraged by coaches or significant others.

> I wasn't able to run for five months and now it's getting harder to watch because you've got that itch and you're capable of doing more, but not quite capable of playing yet..and it's getting harder...(Ashley).

> Certainly, while I was wrestling I never gave myself adequate time to heal up. I do now and also listen to my body, and I've had much less injury problems in recent years...It's been my experience that many coaches do not have their athletes best interests at heart. I've seen (and experienced) coaches who make their athletes compete when they should not.(Athlete's answer from validation questionnaire).

> I usually (always) go back too soon. I think "great, no pain, I'm fixed". I find it almost impossible to increase my mileage by only 10% each week when I feel good. I know interval training is intense, but when everyone else is doing it, and they encourage me, I do too. I need someone to say don't do it, but they don't so I do! (Athlete's answer from validation questionnaire).

In addition to increasing the intensity and duration of activities which were limited by the injury, there was also a gradual or sudden *disengagement* or weaning off from the therapeutic schedule, or from apparatus used to protect the injury.

> Just when I start getting back into things, (so) I might use it (my brace) for a couple of weeks, but that would be it...(Researcher: MmHmm)..and I would just be doing running with the team and limited kicking of the soccer ball and stuff, and then slowly getting into the drills, and eventually near the end of the season I would think, I'd be getting into games maybe half a game here, half a game there. So bit by bit, bit by bit by practising and then into games (Ashley).

> I was playing with a brace for a while...One day I decided it was good enough. I didn't need it any more (Julie).

Healing the body was a major part of the injury experience for these participants. The duration of this healing process varied according to the severity of the injury. It was mentioned earlier that many of the facets of this category interacted with other categories in the phase of *Dealing with the Impact* and the holistic mind-body integration of this process became apparent. The importance of listening to the body's signals as a cue for damage or healing was a major aspect of the healing process.

Another aspect of the impact of the injury was the effect the injury had on the athletes' perception of themselves.

Changing Sense of Self

Another impact of the injury involved the changes that the participants saw within themselves. This included conflicts of wanting to exercise and not being able to, losing trust in one's own body, and a changing sense of one's self-concept in terms of physical (e. g., body image) and personal self (e. g., self esteem). The ways of dealing with emotional sequelae of these changes have been described above.

(a) *Experiencing conflict:* As a result of being injured, the participants, at times, had *conflicts* between what they *wished* to do and what they *could* do. For example, wanting to race and not being able to participate.

> I seem to be standing on one side (of the fence) and wanting to be on the other side (Deborah).

Secondly, the injury can result in conflict arising from a *reduced trust* in one's body, particularly with respect to an injured limb. However, this uncertainty can be alleviated with experience.

> I know if I injured it again I'd heal faster, just because I would know how far to push it this time. Sometimes you don't know how far to push it (Ashley).

Thirdly, there may be a conflict over whether to use a treatment strategy for fear of negative consequences. For example, *becoming dependant* on medications or a knee support, despite the positive consequences, can cause conflicts for an athlete.

> Yes, I guess that's a fear, becoming dependent on the drug. But on the other hand, I mean I'm not prepared to walk around with chronic knee pain all the time (Philip).

> I don't even think I want to start wearing a brace, because I think you can get a lot of psychological dependence on the brace...so I figure if my knee can't do it on its own, I'm not going to do it until it's ready (Ashley).

(b) *Changing Self-Concept and Body Image*: In addition to causing some conflicts within oneself, the injury also had an impact on the athlete's *self-concept and body image*. For example, it seemed as if the injury had deprived the athletes of a significant part of themselves.

> I was a shell of myself to put it that way ...being an injured athlete, and the injury that you had. At the moment it has robbed you of what you were and what you want to become...I'm going to work this much harder to recapture what I once had, in order to compete in the field that I have chosen (Terry).

A change in body image also resulted from the *fitness losses* incurred as a result of injury. The perceived changes in one's body also had effects on the athlete's self-esteem.

> Right now I feel like a fat slob, because I have been sitting on my buns. It's not my fault that I've been sitting doing nothing. But I'm not as in shape as everybody else is because they've been playing sports. But I wouldn't be, if it wasn't for my knee (Ashley).

> ...Of course I gained tons of weight. That created, I remember, real self-esteem problems. I remember a girl told me I was fat once in a bar, and I had always been so skinny (Philip).

> You get a loss in self-esteem. You wake up in the morning. You get out of the shower and you look at yourself in the mirror and you say "God where is the chest gone", ...it's probably not much, but you just tend to over emphasize, I tend to over emphasize feeling small....Just feeling soft and just feeling generally unfit (Bill).

The change in self-concept associated with the injury was also an indication of being *vulnerable* to injury, perhaps, in spite of the athlete's pre-conceived notions. This might lead to self-doubt in some people.

> I realize now I'm not invincible (Deborah).

> I'm not prone to injury at all. I mean I always think of myself as never getting injured...before it happened. I thought I could never get seriously injured, never, and then I really did...It finally showed me that I could get injured....that it's possible and so then you automatically start to doubt (Ashley).

> I overheard two males chatting by the weight room about the effect of their injuries. One said, a leg fracture meant that "He couldn't rely on his body anymore", the second agreed by saying "yeah...I had the same thing, I got injured and it meant I wasn't indestructible any more"...(Author, personal journal notes).

The vulnerabilities suggested by injury can also be a sign of aging and of the *declining resiliency* of one's body.

> I just thought "I'm over the hill" (laughs) ...You start feeling that you're losing your resiliency, to bounce back ...I always wanted to be somebody that could do this for years on end and not only do it at a highly competitive level, but to be somebody's grandmother, and being able to do a 10km....It wasn't so much that I wouldn't be fit enough, but that I couldn't tolerate the wear and tear to do it. It was awful...I just...(had)..started to destroy my body, before I had even hit 30? (Deborah).

Despite being injured, others, however might still *deny their vulnerability*.

> No I don't have a fear that injury can, or may, stop my athletic skills. I don't believe injury is going to be the way that I am going to go out. Because I have always been able to avoid it and, now that I know what I know, I am able to have my body in that much more, better condition. So, no, I don't really have a fear of career ending injury, any more, because I understand now (Terry).

> I don't set any limits to what I can do and that involves my destructibility as well, but I don't feel that I am destructible. I have bounced back before and I will do again (Bill).

In summary, injuries appeared to have an impact on the individual athlete. However, there also seemed to be an impact on an injured athlete's relationships with significant people around them.

Interacting With Others

The impact of an athletic injury can have an effect on a person's interactions with other people. Sometimes the consequences are positive. For example, spending more time in social activities. At other times, the changes can be perceived as being negative. For example, feeling excluded from the team.

The positive aspects of the injury might include spending more time with a spouse and saving a marriage, engaging in more social life, and initiating new friendships.

> I don't think my wife would be around now... No question. I think she'd just had it, because I mean I was running all the time. That was the main thing. ...so..I guess it saved my marriage,...(pause)..Should have kept running, I guess! (Philip).

> I became good friends with one of the girls off..my Ajax team, that's a club team that plays during the summer. So at this point we weren't playing, the club team so I guess, and we did a lot of things together. Just movies and stuff like that. And I guess that's how I replaced my time, just recreationally (Ashley).

> Probably my social life increased a lot more..definitely, because for the simple fact that when I was just concentrating on my training I remember comments from my friends saying "well when ever are you going to come out with us?". And I'd say "well you know...", because I was so into training. I'd go out and train for three hours on a Friday night. So, socially, it increased (Grant).

Other changes may not be so positive. Injured athletes can feel left out from the 'in group' of active players since other teammates may not know what to say to the injured athlete.

> I was sitting out all the time. I felt tremendously bad about that and I think I was looked down on because of that. There was no question...people thought I was swinging the lead [malingering] (Philip).

> I've talked to one of the girls off the team and she says they've tried to avoid talking about like the national championships and stuff like that around me, so that it doesn't hurt me as much (Ashley).

> I go there all the time (the football club). They are all [saying] "You poor bugger someone is treading on your grave or they are sticking pins in a voodoo doll or something"...and that gets annoying (Bill).

The negative moods which were associated with being injured also affected other people, such as a spouse:

> So, sometimes we clash. Because, he would rather..you know he sort of.."Well if you want to go do the race, go and do it. If you don't want to go and do the race, then don't do it. Why is there a problem? You're either on one side or the other side of the fence...that...often flared up last summer, and was really frustrating for both of us because it wrecked some potentially good weekends. (chuckles). (Deborah).

The impact of injuries can, therefore, affect interpersonal relationships with people around you.

Summary of Phase Three- Dealing With The Impact

Once an athlete acknowledged being injured, the injury had an impact which could include intense emotions, a reorganization of the athlete's lifestyle, attempts to facilitate physical healing, changes in social interactions, and an altered sense of self. Variability of the impact depended on a number of factors, including the athlete's previous experience with injury, other life priorities, the perceived severity of the injury, and the timing of the injury. These factors might be subsumed under the rubric of "meaning of the injury". However, all the participants invested energy in dealing with the various sequelae of the injury.

In the next phase, the injured athlete achieved a *physical and psychosocial outcome* . The injury may either have been fully healed or been in need of management on a chronic basis. However, as a result of going through the process, the athletes seemed to learn a great deal about themselves. Part of this learning may, indeed, be the *meaning* that the sport or activity has to each individual. This type of learning has been termed *The Lessons*.

Phase Four - Achieving a Psychological and Physical Outcome.

The final phase of the Risks Model was termed *achieving an outcome*. This phase includes both physical and psychosocial outcomes. The *physical outcome* refers to the extent of healing of the physical injury. The learning and perspective changes that participants indicated resulted from the injury experience were termed the *psychosocial outcome*.

Physical Outcome

At some point, the injured athletes reached a resolution to the injury process. Two major categories were found. These were *partial recovery* and *full recovery*.

Athletes who achieved *partial recovery* were either those who had to manage their chronic injuries in order to continue with their sport, and those who were unable to continue in their sport for fear of re-injury. For example, chronic management of an injury might involve taking anti-inflammatories, modifying the activity, and/or decreasing training loads. Typically, the athletes who had partially recovered from their injuries, either participated in less high-risk activities for fear of sustaining even worse injuries from their sport, or retired from sport altogether.

> Personally, as far as sports are concerned, personally I want to overcome this injury and make sure that it is not going to stuff me up for the rest of my life...So I think I will do things more for the intrinsic satisfaction of having to play it safe...rather than sort of trying to make it in the pro's [football]. ...I am always going to have a slightly weakened knee (Bill).

At the time of writing, the athletes who *recovered fully* from their injury had returned to their sport (participants one, three, four and five), stated that they were having no pain, and were engaged in full training and competition.

Recovery might also be viewed as being relative to an athlete's activity goals. One might not be able to compete at one's chosen sport (partial recovery), yet one might expect to be fully recovered in terms of other activities.

> Yes, permanent disability in terms of contact sports. But in terms of for life, what I am hoping for is going to be full recovery (Bill).

<u>Psychosocial Outcomes- Learning the Lessons.</u>

Whether it occurred during the injury experience or as a result of reflecting back at the end of their process, the participants reported that they had learned a great deal about themselves and their injury. This learning process associated with the injury resulted in the athletes feeling qualitatively different about themselves by the outcome phase. The learning also appears to be part of an ongoing process which continues even after the injury is healed.

> ...I have learned now, and I am still learning (Terry).

The *lessons that were learned* throughout the injury-recovery process were many, and included learning about one's body and injury management, the messages of the injury, and gaining a new perspective.

(a) *Learning About One's Body and Injury Management*

The participants noted that they had learned a great deal about their bodies and how they might manage injuries in the future. The themes in this category involved becoming more familiar with one's body, the meaning of its messages, and its limitations. Additionally, injured athletes tended to learn about the need for early intervention with suspected injuries, and the need to engage in preventative strategies.

The injury, afforded athletes a period of time to become familiar with and to better understand their bodies. The participants also became aware of the meaning of the body's signals. For example, the difference between pain and injury.

> I kind of know my knee very well. I probably know my knees better than most people know any part of their body (Philip).

> I think also that you can start to get a sense of whether something is a wear and tear type of pain, and that is a pain that I am much more concerned about. Because, experience has lead me to believe that that's going to haunt you for a lot longer, than if it's sort of something that is more indicative of a... just sort of a short term suffering that you are going through...(Deborah)

> Pain is something that you may have day-to-day, just from the effects of the work itself, whatever it may be...Pain is something you get just from the work you are doing, itself, as opposed to injury. Injury is what happens to us from our work, or whatever, and that will cause us to miss time from work or to cause us great discomfort so that we have to seek some kind of medical help or as I say miss time (Terry).

> Definitely, I think athletes in general have to make that distinction [between training discomfort and the pain of injury]...because otherwise there is no way you could perform. Every athlete you talk to wants to maximize his or her potential and you can't do that without realizing the difference between the two, I think (Grant).

Thus, the reaction to a potential injury is not only dependent upon listening to the signals the body gives us, but is also related to the personal meanings that we have of the signals that the body sends us.

As a result of the injury, some athletes learned about the vulnerabilities and limitations of their bodies. In particular, they learned to 'pace' themselves.

> (I have) gone from thinking that...you could be suffering a lot, and you could blast along through this pain, but you would be better. You know you could suffer..and it wouldn't be a big deal, but I don't believe that any more...I don't want to destroy these joints, I want to use them for as long as I can (Deborah).

> I have learned that for me, especially with my body and my knees...that if I try to run every day, no matter how I feel, I am going to get injured (Grant).

The injury experience also taught athletes about the need to intervene early with injuries and not delay in seeking attention.

> Well I think it was learning from it. You made mistakes and you don't make those mistakes over again. I wanted someone to tell me what it was right now... straight away...I've got a little growing up to do and realize that when there's pain, STOP! Don't be dumb...You know you've got so much time ahead of you...Why wreck it now? (Grant).

> Gee, this is starting to feel sore. What's going on? The next day I was really sore. Now maybe a couple of years ago, I would have taken one day off and then tried to go back to it. But I knew right away the bad news and I got treated right away and I cut back my..Like I took four days off, and I did a test run, like a little short one and, no, it wasn't good enough...(I) dropped right off and so I took about two-and-half to three weeks where I did very, very little running, and now (I'm) back fine. No problem. So maybe I'm a little smarter (Deborah).

In addition to the need for early intervention with injury, the participants also learned strategies aimed ar reducing the risk of injury in the future.

> ...It just reminds me. To, even in practice, to be aware ...And now, I just have to keep my guards up all the time (Terry).

> The doctor's got me on mentally, starting to think a little more about stretching, So, I do stretch a lot more...(Grant)

> So, now learning preparation, which injuries helped me have the patience to prepare, because you <u>have</u> to have patience when you are <u>injured</u>. Because you can't go like you could go. You can't do what you could do. Because, in '87 was when I really started really treating myself. And, because of that injury, that allowed me to really know that I should come in and spend more time icing myself. And, as I say, taking preventative maintenance, as I would call it (PM), preventative maintenance. And I have seen now, since I have been on that type of program, how my body is so much more loose and flexible, less sore after games now, due to my stretching from martial arts and everything, and my PM that has taken all week... I feel that I am warding off potential injuries, by having my body always serviced, and I'm always asking questions now (Terry).

These quotations also indicated the responsibility that athletes often had in causing their own injuries by not engaging in injury prevention strategies (see phase 1).

(b) *Heeding the Messages of the Injury*

An athletic injury may have some important messages for the athlete. One message might be that the athlete cannot continue in a particular sport or at a certain level of competition.

> Finally it has been battered into me that I wasn't cut out to play it [Australian Rules Football], and that I am probably going to ruin my life if I do (Bill).

> It was a <u>final</u> confirmation. It was almost like this little worm that had been stepped on, comes out the hole again to have a peek. And something crunches it down again and says, get back down there. You know, "Don't you remember you are hurt?". So a definite savage reminder from down there that there was something drastically wrong (Philip).

The injury might also be a message that one's time is up ..

> ...sometimes I look at it like God said 'It's time for you to get injured, you've had luck for so many years. It's time..your turn'... The only way I can explain it was that it was my time (Ashley).

(c) *Gaining a New Perspective and Re-evaluating the Role of Activity.*

Being injured gave the participants a new perspective which helped them see things in a new way. This new perspective included the role of sport in one's life, the need to change one's career or lifestyle goals, and the body's abilities when not injured.

An injury can encourage an individual to reflect on their reasons for doing physical activity and future expectations for engaging in sport.

> ...(the injury) definitely brought my life into more perspective...I remember, one day, sitting under there looking up and saying 'Why the hell am I doing it? Why am I running around here? My knees hurt. This is stupid'. And I got on a bus...That definitely was a realization point....I keep exercise more in perspective now (Philip).

> (the injury)... started to make me think..I was already going to start making compromises in my life anyway, and it made me re-evaluate what does it mean to do this activity. Yes, it was important to me. It was very clear that, "Yes, running is very important to me", but...that's it's not the only thing, and there are other things out there that I draw similar satisfaction from (Deborah).

> I can sort of see that I have changed my perspective in sport from wanting to be in competitive sports to just doing things for myself...and just take sport on what it can give me as pleasure (Bill).

The enforced break from an activity caused by having an injury can also motivate a person to train hard at activities that were previously perceived as unenjoyable.

> Last year I didn't enjoy running as much. Now I'm enjoying running a lot more, partly because I was held back from doing it (Grant).

For some, the injury was a catalyst for change in career perspectives.

> What I knew it (the injury) meant was that I wasn't going to teach very long in Physical Education, and I think that probably had a bearing on my jumping out of Physical Education (Philip).

> I think from the physiotherapist's perspective, I have a better understanding of what that might be like to be on the receiving end of these people, of these athletes coming in (Deborah).

Participants said they also gained a greater appreciation of their abilities when they were not injured.

> Before I took it (running) for granted as something I could always do (Grant).

> Suddenly these things that you mostly take for granted, I was aware of them (Philip).

> I can almost cross my legs now, like you don't take for granted simple things that you used to: like walking or jogging, just going for a nice jog (Ashley).

> Because it was so tight back here, it was just so tight, I just couldn't imagine what was happening to me. It was just compared to this leg, and that lets you appreciate just how it is. How fortunate we are when we are healthy....All through my athletic life I have been virtually unscathed and I felt that I took it for granted in some respects (Terry).

The injury can, therefore, be a significant source of learning for the individual. However, as with most learning it can be remembered, forgotten, or even deliberately ignored.

Ignoring and Acting on the Lessons Learned

Two additional codes emerged from the data and were incorporated into the 'Risks Model'. These concepts were related to the learning that occurred and were termed *Ignoring the Lessons (relapse)* and *Acting on the Lessons (injury management and prevention).*

Ignoring the Lessons

Ignoring the lessons was related to relapsing. Athletes might forget the lessons learned (in phases 3 or 4) and attempt to run the risks of returning to their activity too soon, or misinterpret or ignore the messengers of injury (e. g., muscle soreness). This can result in re-entering the injury process by "getting injured" again.

Evidence for *Ignoring the Lessons* was initially suggested by the participants. They hinted that, given the right circumstances, such as the injury occurring in a racing season or when encouraged by others, they might fall back into their old habits.

> Whenever I'm injured, whenever I feel an injury or a twinge, I just stop, I walk and I...get someone to look at it. I'm not going to wait, that's for sure. But, then again, during racing season it's a whole other story, unfortunately (Grant).

> I had half the neurosurgeons and the orthopedics telling me that I shouldn't play football after the first neck injury and you would have thought that two broken necks would have sort of hammered that point home. But, I suppose that I was pushing my luck to try and play again (Bill).

Ignoring the lessons can be encouraged by such factors as the return of one's feelings of invincibility, or by the influence of others.

> You can catch yourself. You know, on a day where you're feeling a little bit sore, and you keep on going and part of your mind is saying 'recognize this you have felt this before, don't do this', but you keep on going. Then you start having this conflict within yourself. Then you think to yourself, why am I back at this stage again? But,once again I think you start feeling invincible (Deborah).

> Factors related to forgetting the lessons are the influence of others ("the Running group"), the positive feelings of running hard, and the time of year, and one's desire to race. (Athlete's answer from validation questionnaire).

> It sort of gets to a good stage and then a period when you haven't had any problems. Like you can run straight lines and all those standard things. And, you think, if I just take it easy on the court, then it'll be all right. You forget the sudden impacts or different things that obviously happen on the court that you don't expect (Julie).

Others might engage in a cost-benefit analysis to rationalize engaging in risky activities when they are not fully healed.

> Researcher: I wonder if at the moment you are forgetting the lessons a little by putting yourself in situations when you are not 100%...
> (Ashley): I don't think I am forgetting about them, I think I'm just ignoring them.
> Researcher: What is it about that. Why are you doing that?
> (Ashley): It seems like I just..it was fine as long as I didn't wipe out. And I was taking the chance and I have skied for years and on two ski's I'm not scared of wiping out... I would say out of 100 I'd say there was 97-98% chance of..., or shall we say, a three percent chance of injuring myself. And I figure that I have waited long enough. I have held back long enough that, and I am not going to let it spoil my summer, and so I just went for it...

Rationalizing the risks involved helped the athletes to make a decision to return to a potentially dangerous sport.

> I sort of decided, while I was in hospital the first night, that I was never going to play again. By the second and third day...I decided that, because it was such a freak accident, I wouldn't be in any danger of it happening again (Bill).

Therefore, through a process of forgetting, ignoring or rationalizing away the risk of the sport, an individual might forget the lessons that he or she had learned, and, as a result, place themselves at risk for further injury. This can happen either as a result of neglecting preventative measures or by again placing oneself in a dangerous environment. The opposite category was called *Acting on the Lessons*.

Acting on The Lessons

Those who *act on the lessons* that they have learned, such as preventative maintenance strategies or acting on early signs of injury (*Acknowledging the Injury*), are more likely to either get early intervention for their injury, or perhaps avoid injury altogether.

> I have got to keep reflecting back on the process and keep remembering that I do have vulnerabilities. And I do have my limitations. I think this is the first year that I am actually listening to what my body is doing and trying to remember anything that happened last year...If I keep the emotions there, like what I felt like when I was injured, that sort of keeps me going on staying injury free (Grant).
>
> I think it is also a learning phase that when you have been injured enough times, you start to recognize that you have been down this road before (Deborah).
>
> In order to remember the lessons, one should think about the pain of injury, the tediousness of treatment, and the frustration of not running. (Athlete's answer from validation questionnaire).

Ignoring the lessons can lead to the athlete being 'trapped" inside the injuring cycle. However, although accidental, injuries can happen to any athlete. *Acting on the lessons* gave athletes a better chance of avoiding the 'risks of running', and to continue playing injury free.

Summary of the Risks Model

In the Risks Model, athletes typically followed the following sequence of four phases: *Getting Injured, Acknowledging or Interpreting the Injury, Dealing with the Impact of the injury,* and *Achieving a Psychological and Physical Outcome.* As a result of going through this process, participants appeared to learn a great deal about themselves. If these lessons were ignored or forgotten, individuals predisposed themselves to getting injured again. However, if they remembered the lessons, they had a better chance of decreasing their vulnerability to injury.

Passage through the process and the time span for each phase appears to be a function of a number of factors. For example, the type and severity of the injury, the personality of the athlete, and the meaning of the injury and the sport to the athlete. A highly fit competitive, endurance athlete in the middle of an important season may ignore signs of a thigh injury and continue to race because accepting and attending to the injury meant that he or she would miss competing at a time when he or she was most fit. On the other hand, a soccer player who incurs severely injured knee ligaments would not continue playing and would have no choice, but to pull out of the game.

Although common themes emerged, the idiosyncratic nature of the responses to injury speaks to the uniqueness of the athlete's experience. The Risks Model has the flexibility to accommodate these individual differences. A discussion of this issue and the factors of denial and addiction to sport in relation to this process are presented in the next chapter.

A brief report of the results of validation questionnaire process and the author's experience with injury during the data collection period follows.

The Results of the Validation Questionnaire

To increase the validity of the present study (methodological triangulation, Mitchell, 1986), a summary of the results was developed into a questionnaire format and distributed to a number of experts in the field. The validation sample was described in chapter three. Of the 11 questionnaires distributed, 10 were returned: a 91% response rate. A copy of the questionnaire and a summary of the results is shown in Appendix C.

In general, of these 10 respondents, nine reacted favorably to the Risks Model and to the description of the categories. Only one found the model unclear. The respondents added examples from their experience. Two areas which were commented on were (a) the role of the coach in encouraging the athlete to accept or deny an injury, and (b) the effect of an injury on an athlete's identity. For example, athletes who say "I <u>am</u> a football player", rather than "I play football", might have a more severe reaction to the injury. In addition, one respondent suggested that two categories which were originally labelled "Forgetting the Lessons", and "Remembering the Lessons" might be renamed to reflect the <u>behaviors</u> indicative of the category, rather than a speculation on the psychological process underlying the behavior. As a result these two categories were renamed *Ignoring the Lessons* and *Acting on the Lessons* since these labels better reflected the reports of the participants

The results of the validation questionnaire were interpreted as supporting the process. However, since the principle source of data for the model was from athletes, only the responses of two athletes who completed the questionnaire were added to the data of the original sample.

The Author's Experience With Athletic Injury

During this research project, I incurred an athletically related injury to my lower back. In order to bracket my experience, a brief summary of my experience is described below. References to the model are in italics.

This year I was on the comeback trail. I had trained well over the winter and I was gradually getting into training about 10 sessions a week. I had resolved to give my running one last try before I left university and started working full-time. In late April, 1990, I began to feel some tightness and soreness in my right hamstring (*Getting Injured.*). Since the pain went away when I warmed up, I thought it was nothing too serious *(Acknowledging the Injury).* How wrong I was! I was in the best physical shape I had been in for years and did not want to stop training for fear of losing this fine form.

I continued to train and race on the leg (*denial)* and nothing serious seemed to happen. I raced four times in five weeks, which was, perhaps too intense a racing schedule for that time of the year. Then, after a race in London, Ontario, my right hamstring seized up. I reduced my workload during the next week and stretched the muscle out since I had a race to compete in in Banff, Alberta, the next weekend *(bargaining).* During this race in Banff, I again felt tightness in my leg, but ignored it (*denial).* I even managed an hour-long run the next day, despite some pain signals! However, during the next week, the injury became worse. The pain became more intense and moved into my lower back and behind my right hip.

Eventually, I went to see a physician and physiotherapist (*Acknowledging the Injury, healing the body).* Although they were not sure what the problem was, I followed a physiotherapy regimen (deep heat and stretching). Since I wanted to run in a relay in June, we also decided that I should try to maintain some level of running to see if I could run for a hour. I continued to run three of four times a week and also attended group workouts (*bargaining).* However, by late May, I could not run without pain in my hip and lower back. I therefore decided that I had a severe enough injury to warrant stopping exercising altogether (*acceptance.).* By this time, I was working with a physiotherapist who specialized in backs and an orthopedic specialist. I was taking anti-

inflammatories to help control the discomfort, as well as receiving traction, deep heat, and stretching exercises for my lower back. Luckily, I was doing the present research project which helped me focus my attention away from the emotional impact of the injury (*Dealing with the Impact)*. However, I experienced a number of emotions related to the injury, including anger, frustration, depression, isolation, guilt, helplessness, inadequacy, jealousy, longing, loss, disbelief, and uncertainty *(experiencing emotions)*. One way of dealing with the emotions was to try to avoid them altogether *(dealing with the emotions)*. Thus, I tended to keep away from the running and racing scene. It seemed as if people involved in the running scene weren't quite so interested in Jerry Rose once I got injured. Once I started answering such people's inquiries as to "How I was doing", they didn't seem to want to listen to me talk about my injury. For my part I did not want to listen to people say "Well, you'd better be prepared to have to quit running for ever!!" *(interacting with others)*.

Since this was a back injury, I was particularly worried about what it might mean to my running career in the long term. This uncertainty was not helped by professionals who appeared to avoid my question of "What is the prognosis?", by answering "Well these things usually settle down in time", or "It's a long slow process". Although I could not expect perfect predictions from such health professionals, their comments only served to increase my sense of helplessness and uncertainty.

My emotional reaction to the injury appeared to be related to the chronicity of the injury. For example, the longer the injury went on, the more frustrated, angry and depressed I became. I was particularly annoyed at myself for not getting treatment earlier, as I had learned to do with previous injuries *(Ignoring the Lessons)*. I felt that the injury was probably made worse by running through the injury and ignoring the signals of the body.

In adapting to the injury, I had to *reorganize my lifestyle*. Swimming and walking became substitutes for running. Interestingly enough, I felt much better psychologically once I engaged in a walking program. I also began to withdraw away from social activities which meant sitting for prolonged periods of time, since I could not sit without severe pain (*interacting with others)*.

My image of myself as a successful runner began to gradually fade (*changing sense of self*). I certainly could not believe this was happening to me. This meant I was mortal after all! I was also particularly concerned about my body weight and body image. I also sensed that I would not be able to train as hard in the future (*Learning the Lessons*).

I was continually in conflict with myself. I wanted to run, but I knew I should not. However, as soon as I was given permission to run, I started back to running very slowly. Initially I was running slowly, but as soon as I could tolerate more I began to run faster and longer. I probably came back too quickly. Eventually, I had a relapse *(Ignoring the Lessons)*. The injury then began to interfere with my life. The associated pain even started to keep me awake at night.

Encouragement from other people, such as my supervisor, friends, and therapists helped me keep to my therapy schedule *(maintaining motivation)*. Examples of people who had recovered from such injuries, and were now competing, also encouraged me. However, it was difficult to adhere to therapy when the perceived results were not as quick to materialize as I wanted.

After a period of time I received the scan results. They confirmed what the health professionals had said - I had a protruding disc in my lumbar spine. By this time, my injury had lasted four months and the fatigue from the lack of sleep, caused by the pain, was now interfering with my daily life. My orthopedic specialist referred me to a orthopedic surgeon specializing in backs, with the aim of getting an operation *(healing the body)*. In response to this referral I had mixed feelings. On the one hand I felt relieved that a solution was at hand and that I was able to schedule an appointment with the surgeon earlier than expected. On the other hand, I was worried about possible complications of surgery, the required rehabilitation time, and the effect on my work, and on my running future. At the time of writing, I am scheduled to have an enzyme injection into the disc to shrink the disc protrusion on December 3rd., 1990. Some say I am lucky to get the operation scheduled so soon. I, however, think that two months is a long time. Particularly when the surgeon raised my hopes when he told me the waiting period would be only two to three weeks!

In terms of *achieving an outcome*, I have learned about my limitations and relearned the need for early intervention with injury. Now, I also feel that I may have to change sports so that I don't

damage my spine permanently. Due to my research focus in this period, I am not sure whether the full impact of this injury has yet sunk in; partly because I am still unsure of what the injury means for me in the future. However, I now realize how important one's back is and the many things you cannot do with a bad back. In terms of my professional role, I have a much better understanding of others' experience of lower back pain and sciatica. For me, the *psychosocial process* associated with this injury appears to be ongoing. The insights and learning relative to the injury seem to change every day. I do not feel that the reflection as to the meaning of the injury is a static event which occurs at the end of the process. I now feel that the reflection is an ongoing process, affected by the new information about the possible outcomes of the surgical procedure, which I receive from friends and other athletes.

At the time of writing this document, the *physical outcome* of this injury is uncertain. I am currently in the phase of injury management.

Chapter Six

DISCUSSION AND SECONDARY LITERATURE REVIEW

In this chapter the results are discussed in relation to the extant literature in a number of areas. First, the present findings are compared with the following two existing theoretical models related to athletic injury: the Grieving and Loss Model, as discussed by Astle (1986), Gordon (1986), Musielewicz (1989), Pederson (1986), and Rotella (1984, 1988), and the Stress Response Model espoused by Weiss and Troxel (1986) and Wiese and Weiss (1987). The current findings are also supported by other extant data where appropriate. Thus, in a sense, this section also serves as methodological triangulation (Mitchell, 1986). That is, extant literature can be an additional source of data related to the phenomenon in question. If the current data are supported by other data sources, then the validity of the model is enhanced.

Secondly, of the many interesting findings that emerged from the data, three were chosen for further discussion. The Risks Model is compared with models describing *the process of adapting to other types of injury*, such as traumatic head injury or spinal cord injuries. Due to the participants' reference to an *addiction* to exercise, a second section examines the concept of exercise addiction as it pertains to the Risks Model, and compares the Risks Model to a model of *addiction*. Finally, since *denial* was an important part of the process, there is also a discussion about the nature of denial and its relevance to the present findings.

A Comparison of the Process with Existing Models of Psychosocial Aspects of Sports Injury

Recent theoretical literature has proposed two models related to the psychosocial aspects of sports injury. These are the Grieving and Loss Model, and the Stress Response Model. These are discussed in terms of their relevance to the process which emerged from the present study.

The Origins of the Grieving and Loss and Stress Models

The origins of the grieving and loss, and stress-reaction models pertaining to athletic injury are briefly described before comparing them with the 'Risks' Model. The model of a person's reaction and adaptation to grieving and loss has been adapted from the Humanistic-Transpersonal

perspectives of death and dying, which has been greatly influenced by the work of Elizabeth Kubler-Ross (1969) (see, Clark, 1990). This approach espoused that a person will move through a number of distinct stages during the process of resolving their personal grief. Thus, a person sequentially experiences denial and disbelief, anger and frustration, bargaining, depression, and acceptance and resignation. Although stage models of grieving have little supporting data and have lately been discouraged (Clark, 1990), writers in the area of psychological aspects of sports injury (e. g., Gordon, 1986, Musielewicz, 1989) have used this model to explain the psychological reaction of athletes to injury. The Grieving and Loss models, as they have been applied to the area of athletic injury, are also briefly discussed in chapter two.

Stress-reaction models of response to athletic injury (e. g., Weiss & Troxel, 1986; Wiese & Weiss, 1987) have been developed from Passer's (1982) model of the stress process in athletes. Passer's (1982) model, in turn, evolved from other models of stress arising from sport and health psychology (e. g., Lazarus, 1966; Martens, 1977; Sarason, 1980, cited in Passer, 1982). In general, these models describe a four stage approach to the stress process. These stages involve (a) an initial stimulus, (b) an appraisal of the situation and personal resources to cope with it, (c) an emotional response based on this appraisal, followed by (d) a behavioral consequence. This model is also described in more detail in chapter two.

In the following section, each phase of the Risks Model is compared to the phases of the Grieving and Stress models of response to injury.

Phase One - Getting Injured

The first phase of the Risks Model was entitled *Getting Injured*. In this phase, the participants described the etiology of the injury. This phase appears similar to the first of four concerns expressed in Wiese and Weiss's (1987) model of psychological rehabilitation of athletic injury, that is 'How do injuries happen?'. Wiese and Weiss stated that if the etiology of an injury could be delineated, then a variety of strategies could be implemented to reduce injury risk. The factors they considered included risk-taking behavior, anxiety, major and minor life stresses, and personality traits.

In the Risks Model, the etiology of the injury was described by the participants. Although the participants did not mention the role of anxiety, major and minor stresses, other factors such as risk-taking and personality traits were found in the data. Thus, some athletes put themselves at the risk of injury by not engaging in injury-prevention activities, such as stretching and warming up. Other athletes risked injury by participating in high-risk contact sports, such as Canadian Football or Australian Rules Football.

Participants who overtrained, or competed beyond their capabilities, predisposed themselves to injury. This etiological pathway supports the literature (e. g., Diekhoff, 1984; McClay et al., 1989) suggesting that highly compulsive or self-motivated athletes can increase the probability of getting injured by pushing themselves too hard. Such risk-taking behavior exemplified Running the Risks in the first stage of injury.

Wiese and Weiss (1987) suggested that an awareness of one's injury predisposing behavior, coupled with appropriate support and feedback from significant others, can lead to a reduction in injury by controlling injury-causing factors. This appears akin to Learning the Lessons, by which the athlete can become aware of injury-predisposing habits, and then learn new methods for injury-prevention.

In relation to the Grief model, this initial phase of getting injured might be accompanied with feelings of shock or disbelief. This emerged in the Risks Model under the rubric of 'Impact'.

Phase Two - Acknowledging the Injury

The second phase of the Risks Model, Acknowledging and Interpreting the Injury, appears to have corollaries within both Grief and Stress Response models. For example, Wiese and Weiss (1987) indicated a second concern, which was "How do athletes respond to injury". This concern incorporated both phases two and three of the Risks Model.

In the Grieving and Loss models, the five stages of response to an injury are: (a) Denial/Isolation, (b) Anger/Jealousy/Resentment, (c) Bargaining (Postponing the Loss), (d) Depression (emotional impact), and (e) Acceptance/Resignation (e. g., Astle, 1986; Gordon, 1986). The second phase of the Risks Model appears to incorporate stages (a), (c), and (e) of the

Loss model, since it contains a continuum between Denial and Acceptance. However, there is some discrepancy as to the relative timing of the emotional responses of anger and depression, since in the Risks Model, it appeared that the emotional impact, which included both anger and depression, followed or was contiguous with a full or partial acknowledgement of the injury, rather than preceding it. For example, the athletes accepted the injury and got treatment for it, yet at times they could still feel frustrated, depressed, and angry.

Further evidence for a concurrent, rather than sequential, pattern of emotions was shown by Smith, Scott, O'Fallon, and Young (1990), who noted simultaneous elevations of anger and depression on the POMS. In support of this trend, Gordon (1986) suggested that the sequence, or even existence of such stages, may not be as important as moving the injured athlete quickly through from Denial to Acceptance so that treatment for the injury can be initiated as quickly as possible.

The Risks Model is also similar to the Stress Response model whose second stage involves a cognitive appraisal, or interpretation of the injury and one's personal resources to deal with it. Thus, as a result of an unconscious or conscious appraisal, the injury might be denied, bargained with, or accepted. This appraisal is dependent on the context and the individual's perception of the injury. For example, if the injury is incurred near the end of the season, and the athlete perceives that he or she can 'handle' the injury for one more game, or that the injury is not that serious, then he or she might deny the injury. This conceptualization of the appraisal process of the meaning of the injury and the athletes ability to cope with it, therefore, supports the second phase of the Risks Model.

In summary, there appears to be supporting evidence for the second phase of the Risks Model from both the Stress Response and the Grieving Models.

Phase Three - Dealing with the Impact

Once the injury had been acknowledged, or the messages interpreted, the injury resulted in an impact on the individual. What evidence from the Stress Response and Grieving Models supports this phase?

In the Stress Response model, once the injury has happened, and been cognitively appraised by the individual, an emotional response results. This appears similar to the emotional impact of the injury in the present model. Wiese and Weiss (1987) noted that physiological arousal, anxiety, and worry are often emotional responses.

This third phase also appears to be congruent with the depression stage of the grieving and loss model, which is characterized by feelings of anger, sadness, frustration, helplessness and guilt (Astle, 1986). These emotions were also expressed by the participants in the present study. An intense pre-occupation with an injury may also occur at this stage of grieving (Pedersen, 1986; Wiese & Weiss, 1987), and this appeared to characterize the participant's experience of this phase. The emotions expressed by the injured athletes compared favorably with those described by Chan and Grossman (1988), Gordon and Lindgren (in press), Smith et al. (1990), and Weiss and Troxel (1986), and is shown in Table 2. However, the depression stage of the grieving model does not explicitly describe the other emotions that the athletes experienced such as fear, frustration, faith, or hope.

As part of dealing with the impact, the athletes also had to adapt to the new situation of being injured. This phenomenon is also described in both the Stress and Grieving models. In the stress model, this was termed *the behavioral consequence* (e. g., adhering to therapy). In the Grieving model, adaptation was termed reorganization "when athletes begin to display renewed interests and return to previously important activities" (Wiese & Weiss, 1987, p. 322), or adjustment (Astle, 1986), where energy is reinvested in other meaningful activities. This behavior was seen in Phase three of the Risks Model in the categories *re-organizing lifestyle*, and *healing the body*.

Optimizing adjustment to the injury was a third concern of Wiese and Weiss (1987). They asked, "How can psychological recovery be facilitated?" (p. 323). Wiese and Weiss and others (e. g., Danish, 1986; Faris, 1985) discussed the importance of the therapist establishing rapport and trust with the patient, as well as openly and honestly communicating information about the injury. Similarly, Wiese and Weiss (1987) also described several motivational strategies, such as self-talk

and social support, to aid athletes in adhering to their treatment program. Again, these concepts were discussed in the Risks Model in the category *healing the body.*

Phase Four - Achieving an Outcome

The final phase of the Risks Model was Achieving a Physical and Psychological Outcome. Here the athlete reached some form of resolution for his or her physical complaint, such as complete recovery and return to sport. In addition, the psychological outcome is one of learning (Learning the Lessons) and a changed perspective. In the Grief model the final phase is one of acceptance or resignation to the injury where the person learns to live with the loss without excessive emotional responses. This might be equivalent to someone who has been required to give up a sport due to the injury and has to learn to live with it, or who engages in different activities to fulfill the needs which the sport used to satisfy.

In the Stress Response model, if new adaptive responses to the stress of injury, such as relaxation or cognitive restructuring are learned during rehabilitation, then certain lessons will have been learned. However, these models do not explicitly describe the change that happens within the individual as a result of the injury, such as re-evaluating the meaning of sport to one's life or learning the need for early intervention. To my knowledge, this latter information appears to be a novel contribution of this study. The concepts of *Ignoring* and *Acting on the Lessons* also appears to be another contribution to this area.

Ignoring and Acting on the Lessons

Neither the Stress Response model or the Grieving model explicitly delineate the concepts of ignoring and acting on the lessons. However, Wiese and Weiss (1987) implied that learning how injuries happen can help individuals avoid injury in the future *(Acting on the Lessons).* Similarly, Weiss and Troxel's (1986) model of Stress, possessed a cyclical quality by which maladaptive behavioral consequences of the stress response can result in adverse effects on the healing process (*Ignoring the Lessons*). For example, attempting to return to the activity too soon (see Astle, 1986, p. 284) can result in imperfect healing or re-injury.

Summary

The comparison between the phases of the Risks Model, and stages of the Grieving and Loss, and Stress Response models is summarized in Table 10.

Table 10

Comparison of the Risks Model with the Grieving and Loss, and Stress Response Models.

	Risks Model			
	Phase One **Getting Injured**	Phase Two **Acknowledging the Injury**	Phase Three **Dealing With the Impact**	Phase Four **Achieving an Outcome**
Stress Response Models (e.g., Wiese & Weiss 1987).	How do injuries Happen?	How do athletes Respond To Injury? Appraisal	Emotional/ Behavioral Consequences	None
Grieving and Loss Models (e.g., Gordon, 1986; Astle, 1986)	Shock Disbelief	Denial/ Isolation Bargaining Acceptance	Reorganization	Acceptance/ Resignation?

In summary, it appears that the phases of the Risks Model are paralleled in both the Grieving and Loss, and Stress Response Models. However, stage-related models of adaptation or response to injury have not been without their critics. Current thinking (e. g., Gordon, 1986; Wiese and Weiss, 1987), has suggested that the response to injury can be very idiosyncratic, rather than following a predictable set of stages. As such, stage-related models of the psychological response to injury are, therefore, seen as a useful heuristic device to aid in understanding the experience of injury and by providing hope via an expectation of change (Weiss & Troxel, 1987). This topic is discussed next.

A Comparison of Aspects of the Psychological Response to Athletic and Non-Athletic Injuries

How do the results of the present study compare to the experience of people who have incurred non-athletically related injuries? First, to address this question, the similarity of the experience of athletes and non-athletes to injury is compared. The aspects of the injury experience which are compared include the patient-therapist relationship, injury as an emotional experience, loss of body control, effects on relationships, the impact on the self, the meaning of the injury, and changing perspectives. Secondly, a comparison is made between the Risks Model and two stage models of adaptation to injuries which are not athletically related. Finally, stage theories of adaptation are critiqued and the usefulness of the Risks Model is evaluated.

Comparing the Injury Experiences of Athletes and Non-Athletes

A perusal of the rehabilitation psychology literature has highlighted a number of similarities in the experience of athletic and non-athletic injury. Due to limitations of space, the list of similarities is not exhaustive, but includes the patient-therapist relationship, the emotional aspects of being injured, losing bodily control, the effects of injury on social relationships and self-perceptions, the meaning of the injury, and changed personal perspectives resulting from the injury.

The Patient-Therapist Relationship

The participants in the present study spoke about how good communication and a trusting relationship between the athlete and the therapist enhanced the rehabilitation process. For example, faith in the therapist helped some athletes adhere to their treatment schedules.

Bartels (1984) and Murdaugh (1984) both noted the importance of the patient-professional relationship when treating non-athletic traumatic injuries. For example, anxiety and helplessness can be reduced if the therapist communicates accurate and understandable information about the injury to the patient (Bartels, 1984, p. 32). Similarly, education, coupled with soliciting a patient's perception of their current physical status and expectations for the future, can help decrease potential uncertainty and distorted notions of their health status (Murdaugh, 1984).

The patient-professional relationship, therefore, appears to be crucial for successful rehabilitation in both athletic and non-athletic populations. Interestingly enough, Danish (1986) and Gordon et al. (in press-a, in press-b) have recently highlighted the need for training health professionals in communication skills in order to develop rapport and understanding of the athlete, as well as eliciting trust from them.

Injury as an Emotional Experience

Athletic and non-athletic injuries appear to elicit similar emotional experiences. Not only are the emotions similar, but the sources of these emotions and ways of dealing with them are similar too.

The participants in the present study experienced a number of emotional reactions to their injuries including anger, frustration, depression, fear, and uncertainty. Similarly, many authors have noted that emotional sequelae such as depression, anxiety, sadness, grief and anger (Krueger, 1984), as well as fear, guilt, and shame (Krupnick, 1984) are natural and appropriate reactions to traumatic injuries (e. g., resulting from a motor vehicle accident).

How the participants appeared to react to their injuries depended on the significance the injury had for them. For example, an injury which meant missing activities which, up until then, had been her life, resulted in a depressive reaction for one participant. In relation to traumatic injury, Krueger (1984) noted that the severity of the emotional reaction to injury depended on the significance of the injury to the individual. For example, cognitive deficits resulting from injury can be more emotionally significant for those people whose career and lifestyle depend on intellect. Similarly, those who pride themselves on physical activity might react more to physical injury and disability than those who don't pride themselves on physical activity.

The sources of the emotional responses of athletes and non-athletes appear to be similar. For example, athletes said they did not feel good about themselves when they could not perform well, or became depressed when they gained weight, or lost their athletic physique. Krueger (1984) noted that depression is an understandable reaction if an injury affects an individual's mechanism of maintaining self-esteem. This appears true for both athletes and non-athletes. Thus, if success in sports is a method of maintaining self-esteem, then once this method is

threatened, the athlete may become depressed, particularly if he or she possesses no other compensatory mechanisms to redress the balance (e. g., school or work achievement).

Anger was a common emotional reaction for the participants in the present study. Krueger (1984) also noted this as a response to traumatic injury. The source of anger resulting from the losses caused by athletic or non-athletic injury and ways of dealing with them appear to be similar. For example, Krupnick's (1984) treatise on post-traumatic stress disorders (PTSDs) suggested that the anger and frustration associated with a trauma could be classified into two major themes. The corollaries of these themes in the present study are noted in brackets. The two themes were: (a) rage at the source of the trauma (e. g., the athlete who tackled you); and (b) rage at those exempted from it (e. g., "those that can still go out and run").

Many of the injured participants mentioned that the injury was evidence of a vulnerability which they may not have experienced before. This led to self-doubt in some athletes, and appears similar to the reaction of trauma victims. For example, Krupnick (1984) noted that shame and loss of self-confidence could arise as a result of an injury, puncturing "the usually unconscious expectation of personal omnipotence or total control" (p. 21), and also led to the "discomfort over vulnerability" (p. 21).

Similar to the findings of the present study, Krupnick and Horowitz (1981) found that in cases of personal injury, fear of repetition (e. g., re-injury) and feelings of guilt over responsibility (e. g., injured athletes not stretching) were the most common reactions. However, rage at the source of the stressful event and discomfort over vulnerability also appeared frequently. "With a traumatically induced physical disability, the tomorrows also become qualitatively different. The illusion of timelessness and immortality vanish harshly with a life threatening or near death experience" (Krueger, 1984, p. 3). Thus, the realization of one's vulnerability appeared to be part of the learning resulting from both athletic and non-athletic injuries.

The emotional effect of injury highlights the need for interventions in this area, if necessary. Thus, "integrated physical and emotional care can promote positive outcomes in illness and disability" (Bartels, 1984, p. 25). This generalization certainly seems to be important for both

athletically and non-athletically related injury, and, again, is an example of the adage "treat the athlete, not just the injury." For example, anger can become an obstruction to rehabilitation if it is externalized and generalized onto the health professionals involved. It may be a target for intervention if it becomes a problem in therapy.

Thus, the emotional sequelae of injury seem similar for both athletic injuries and traumatic non-athletic injuries. Another similar experience between the two types of injury appears to be the loss of bodily control.

Loss of Body Control (from Bartels 1984)

The helplessness of not being able to be physically active, becoming dependent on others, and not being able to help out teammates when they were needed, led to frustration in many of the participants. This discomfort with enforced dependence is also experienced by non-athletes.

Bartels (1984) stated that, in general, it is difficult for people to become dependent as a result of injury, "particularly for physically active, independent adults, traumatic injury creates a stressful situation of forced dependency and physical helplessness" (p. 26). Bartels also mentioned that this loss of physical control can have an emotional impact due to its effect on the individual's sense of personal control. Another area of similarity between athletic and non-athletic injury is its effect on interpersonal relationships.

Effects on Relationships

An injury can have an effect on one's personal relationships. This effect might be seen in relationships with teammates or in one's role within the family.

Many of the participants perceived that other people (especially teammates and acquaintances) treated them differently when they were injured (e. g., "Oh I should put you down as an over-the-hill-athlete," said Dr. X.). Thus, for an athlete, an injury can elicit jokes about one's physical prowess, as opposed to the adulation associated with previous performances. Although said in jest, these phrases and adjectives (e. g., "Here's the gimp") can hurt after a while. It was also noted by the participants that they felt other people reacted to them differently. Thus, teammates avoided one participant because they did not know what to say to her. In general, Krueger (1984)

suggested that an injury or trauma can affect an individual's ability to elicit "gratifying responses" (p. 9) from others. People can and will react differently to an injured person .

The athletes mentioned the need for support from friends, family, teammates, and coaches during their rehabilitation. Bartels (1984) also indicated that patients in an intensive care unit need emotional support and attention, particularly when the patient's own ability to cope may be depleted. This support usually comes from social and family contacts. However, if friends, teammates and family do not know how to react to an injured person, such support may or may not be forthcoming.

Finally, the patient's role in the family may change as a result of either an athletic or non-athletic injury (e. g., as mother or provider). This was not expressed by the participants in the present study. However, Gordon and Lindgren (in press) noted that a professional cricketer's back injury meant the possible loss of earning ability and, perhaps, his self-perceived identity as the family's provider. The professional athlete in this study did, however, play through his injury for 14 games while getting therapy. Thus financial, as well as personal (e. g., performance), incentives may encourage bargaining-type behaviors in response to injury.

The Impact on the Self

An injury can have important repercussions to one's self image or self-esteem. Firstly, a physical injury has to be accommodated into a person's pre-existing self-schema, and this may or may not be successfully completed. Secondly, the accuracy of an individual's perception of her/his post-injury status is an important mediating variable of an injury's impact.

Reports in the literature and from the participants in this study indicated that changes in an athlete's self-image occurred as a result of an injury (e. g., Danish, 1986). This also seems to happen in non-athletes. Krueger (1984) stated that, "[i]t is important to recognize how any physical defect or extreme physical situation, however minor, has consequences on an individual's self-esteem, self-concept, and narcissism" (p. 5). Murdaugh (1984), for example, suggested that "[p]hysical impairment or injury may be hard to fit into the self-image of a 40 year old factory foreman" (p. 38). In fact this change in self-image is one of the many factors that has to

be taken in to account when an individual has to "come to terms with the special meaning to him or her of this major event in his or her life" (p. 38). Similarly, the athletic participants appeared to have difficulty coming to terms with their new, if only temporary, inactive roles.

In terms of post-injury body image, some of the participants appeared to have an accurate perception of the physical aspects of their injury, yet others did not, and/or were going through the injury experience for the first time. In relation to the general population, Murdaugh (1984) suggested that the accuracy of a patient's post-injury body-image can be an important factor in dealing with the injury's impact. For example, an inaccurate perception of what has happened to one's body, and/or incompletely understood or retained medical information, can lead to uncertainty and anxiety (Murdaugh, 1984). As a result, education and attempting to understand the patient's perception of "what is going on" are important therapeutic steps to go through in order to alleviate unnecessary anxiety on the part of the injured client, whether an athlete or not.

The Meaning of the Injury

Once an injury has happened, the participants engaged in a reflective search as to the meaning of the injury (phase four outcome). This reflection may be ongoing throughout the recovery process or be performed after the injury has been healed. The meaning of the athletic injury appeared to be different depending on the reasons that an individual engaged in physical activity. This search for meaning also occurs in automobile accident victims..."No two automobile accidents, however similar the external circumstances and the actual injuries, will be experienced the same way by the two victims. Each accident will mean something different to the person concerned" (Murdaugh, p. 38).

One outcome that emerged from reflecting about the meaning of athletic injury appeared to be a changed perspective on life. Does this happen in non-athletic injury too?

Changing Perspectives

Similar to the participants who discussed a change in perspective as a result of their injury, injured non-athletes and the disabled appeared to have a similar experience, particularly in relation to taking their physical abilities for granted.

> Not only must infants and old people struggle with their bodies, but the disabled must also. Things once taken for granted - an incline, a curb, turning over at night, brushing away a tear with an able limb - can no longer be assumed and automatic. The life cycle is viewed from a new perspective... (Krueger, 1984, p.3).

Thus, an injury, whether athletically-related or not, can have a profound impact on the way that the individual perceives the world. Interestingly enough, all of the participants noted that they had taken their existing abilities for granted and that the injury gave them new information about their bodies' limitations.

Although this discussion is not exhaustive, many aspects of the psychosocial experience of injury appears to be very similar for both athletic and non-athletic traumatic injuries. Another similarity appears to be psychosocial stages of adaptation to an injury.

Comparing The Risks Model to Stages of Response to Non-Athletically Related Injury.

The previous discussion noted a similarity between the experience of athletic injury, and traumatic injuries or disability. In this section the process outlined in the Risks Model is compared with two generic models of the stages of psychological adaptation to disability, which are not specifically geared to athletes.

A number of models have been proposed that describe the psychological adaptation process to various injuries. There seem to be a large number of these models which vary in the number, type, and sequencing of stages. These models are briefly overviewed.

The first model, proposed by Vash (1978, 1981), was developed from her own experience of being 70% paralyzed. It appears that Vash evolved her model from her own experience, combined with East Indian philosophy on reaching transcendence, and Kerr's (1977) model of acknowledgement of an injury. In sum, Vash saw disabling injury as a path or a catalyst to reaching a higher level of consciousness.

Vash (1978, 1981) proposed a three stage model of adaptation to disabling injury. These are: (1) Recognition of the facts, in which the individual admits to the limitations of the injury, but detests it; (2) Acceptance of implications, and integration of the disability into one's lifestyle. Here

the disability is seen as an inconvenience; and (3) Embracing the experience of being different, and accepting injury as a potential catalyst, and gift. Here disability is reframed as a gift or as a opportunity for learning.

In relation to the phases of the Risks Model (shown in italics), Vash's stages appear to coincide with the phases of *Acknowledging the Injury* (Recognition of the Facts)and *Dealing with the Impact* (Acceptance of Implications), and the code of *Acting on the Lessons* (Embracing the Experience). However, although all the athletes in the present study came to view their lives from a different perspective, and may have even seen the injury as a good thing, only one appeared to achieve a transcendental state described by Vash (1978, 1981). The differences between the present model and that described by Vash might be explained by the permanence and severity of Vash's disability (paralysis), compared with the injuries sustained by the participants.

A second 'stage' model of adaptation to injury has been submitted by Krueger (1981-1982, 1984). This model appears to have been based on Krueger's clinical impressions of the reactions of normal and psychopathological patients to physical injury and disability.

Krueger (1981-1982, 1984) described a five stage process through which trauma victims may pass to achieve a "healthy adaptation" (Krueger, 1984, p. 7) to injury. The stages are (1) Shock, (2) Denial, (3) Depressive Reaction, (4) Reaction Against Independence, and (5) Adaptation. The passage through Krueger's model appears similar to that proposed for the Risks Model, since the stages "may not be neat distinct and progressive" (Krueger, 1984, p. 7). Again, this stage model appears similar to the grieving and loss models cited earlier.

Shock, Denial, and Depressive reactions were also seen in the Risks Model, although not necessarily in that order. For example, denial might have preceded the recognition of the injury which then lead to shock. Generally, though, it did seem as if depression followed denial in both Krueger's (1984) model and the Risks Model. However, there appears to be a more complex emotional reaction to injury than just depression. A large number of other feelings including anger, fear, guilt and uncertainty were experienced by athletes. As such, generalizing depression as the emotional response to injury is a gross oversimplification.

Krueger's fourth stage of a Reaction Against Independence, where trauma patients do not wish to become independent after rehabilitation, did not emerge from the athletes who were interviewed. This may have been due to the fact that the athletes were not aware that this phase occurred in rehabilitation. However, Gordon, Milios and Grove's (in press-a) study of sport physiotherapists' perceptions of athletes' responses to injury indicated that compared to members of the general public, athletes were more concerned with the time frame of rehabilitation (wanting to get better quicker) than their non-athletic counterparts. Thus, in general, athletes appear to want independence as soon as possible after injury (perhaps too much so). This is congruent with the general pattern of reluctance of the participants to miss out on their physical activity and their need to get 'back on track' as soon as possible.

Krueger's (1984) final stage of Adaptation appears similar to *Dealing with the Impact* (stage 3). This is a stage where coping resources are brought to bear "to solve problems and reduce stress" (p. 10). Unlike Krueger's model, depressive-type reactions were also part of this stage in the Risks Model. For example, although dealing with the impact may involve rehabilitation and acceptance of the injury, the participants indicated that depressive-type responses occurred when improvements in function were not forthcoming. Depressive-type reactions might, therefore, be a mediating variable during this stage (e. g., by detracting from rehabilitation efforts). However, as Krueger (1984) has pointed out, the boundaries between the stages of his process might be indistinct and the order of passage through them variable. Thus, a person may be involved in two or more stages at the same time. These characteristics relate to the Risks Model also.

Many of the findings from this present study are not included in Krueger's (1984) treatise. For example, Krueger's (1984) model does not explicitly discuss returning to activity (although this might occur as a function of adaptation), *bargaining*, or the possibility of relapse *(Ignoring the Lessons)* which are part of the Risks Model. Nor did he discuss the learning that people incur as a result of their injury. Additionally, in relation to the emotional impact of the injury, Krueger failed to discuss the fears and frustrations that accompanied an athlete's reaction to injury. Thus, in

relation to Kruger's (1984) model, athletes appear to have similar stages in their process of response to injury, but may also have some unique factors (e. g., ignoring the lessons and bargaining). As a result, the Risks Model appears to be a more in-depth description of "what is going on."

Finally, in reviewing a number of different models, Crewe and Krause (1987) stated that stages such as shock, denial, depression, adaptation and resolution are deemed to be common phases of the psychological processes associated with spinal cord injury. These models appear similar to the grieving and loss models, which were proposed as models for the response to athletic injury. All the models Crewe and Krause (1987) reviewed, implied that an individual moves from the initial impact of the injury, through defensiveness, to recognition and acceptance of the injury. In this way the 'generic' model for adaptation appears to be very similar to the second, third, and fourth stages of the Risks Model. However, Crewe and Kraus (1987) noted that the models they reviewed were all based on clinical impressions, whereas the Risks Model was developed from data elicited from injured athletes.

In summary, a number of models describing stages of adaptation to athletic and non-athletic injury have been presented in the literature. These models differ in their terminology, number of stages, and sources (e. g., from clinical impressions, or application of pre-existing models). The commonalties between these models appear to be a change from initial stages of denial, through acceptance, to coping with the impact of the injury, and perhaps a reflection of the meaning of the injury. Some authors (e. g., Gordon, 1986; Krueger, 1984) have warned that passage through these stages may not be sequential, the boundaries between phases may be indistinct, that there might be vacillation between stages and, perhaps, a person may not pass through all the stages. The present Risks Model appears to have features similar to these models, as evidenced by the many possible pathways described between the stages. A summary of the comparison of the Risks Model with Vash's model (1978, 1981) and Krueger's (1981-1982, 1984) model of reaction to injury is shown in Table 11.

Although there seems to be some evidence for such stages of response to injury, stage theories are not without their critics (e.g., Caplan & Shechter, 1987) who have argued that responses to injury are not predictable, but are very idiosyncratic. This issue is discussed next.

Criticisms of Stage Theories

In terms of the experience of, and dealing with the impact of the injury, athletes and non-athletes seemed to share a number of similarities in the issues that they have to deal with, and the pattern of their responses. However, both athletes and non-athletes appeared to demonstrate idiosyncratic responses to injury. This finding is in contrast to those authors who have espoused a predictable sequence of stages to response to injury (e. g., Krueger, 1984). A brief critique of stage theories which have been developed for Spinal Cord injury will highlight some of the concerns about models of adaptation, concluding with an evaluation of the Risks Model in relation to these criticisms.

Table 11

A Comparison of the Risks Model with Two Models of Reactions to Physical Injury and Disability.

	Risks Model			
	Phase One **Getting Injured**	Phase Two **Acknowledging the Injury**	Phase Three **Dealing With the Impact**	Phase Four **Achieving an Outcome**
Vash (1978) (e.g., Wiese & Weiss 1987).	No equivalent	Recognition of the facts	Acceptance of Limitations	Embracing the Experience
Krueger (1981-1982, 1984).	Shock	Denial	a. Depressive Reaction, b. Reaction vs. Independence, c. Adaptation	No equivalent

Stage-related theories of adaptation to injury have been criticized by a number of authors. For example, Crewe and Krause (1987), Caplan and Shechter (1987), and Trieschmann (1988)

highlighted the paucity of literature supporting the notion that the process of adaptation to physical illness or injury follows an identifiable sequence.

Crewe and Krause (1987), and Caplan and Shechter (1987) supported the notion that, although stage theories are useful, they can also have the potential to be misused. Thus, stage theories can be useful heuristic devices to help individuals understand what they are going through and can also provide hope in the form of an implied promise of change. On the other hand, the danger of stage theories "lies in the rigid application of the theories, that is, in attempting to make the person fit the theory, rather than using the theory as an aid in interpreting reactions" (Crewe & Krause, 1987, p. 4). Caplan and Shechter (1987) agreed and suggested that the notion of stages of adjustment only implies an understanding and may actually hinder rehabilitation. For example, a professional may feel the need to have to confront denial or talk a person out of depression, even though the reaction is not dysfunctional, rather than let the process take its own course. Caplan and Shechter (1987) suggested that a person's reaction and adaptation to an injury is idiosyncratic, and they have promoted a psychological approach to injury adjustment based on individual differences. For example, a person will not react to an injury itself *per se*, but rather to the meaning that that injury has to him or her. Thus, each individual's reaction will be different depending on the individual meaning of the injury.

In summary, Caplan and Shechter (1987) suggested that: "The traditional view...of a natural, invariable and inevitable series of stages of adjustment is an untenable over-simplification that provides a poor basis for assessment and treatment of rehabilitation patients" (p. 135). These authors conceded that stage theories were at their most useful as a heuristic device, in which the number of stages was kept to a minimum, and which allowed the greatest amount of latitude for individual differences to be accommodated.

In a more recent critique of stage theories, Trieschmann (1988) recently reviewed the literature on stage-based models of adjustment to spinal cord injury (SCI). In her brief review of nine studies investigating injury, there were nine different models. Her critical review concluded that (a) researchers tend to bias their studies by only asking about the emotions they think should be

present (thus encouraging a self-fulfilling prophesy); (b) stage theories have tended to be based on an author's clinical impressions rather than reliable and valid data on the "existence, sequence, or duration of these stages" (p. 69); (c) present models have tended to emphasize pathology in the patient rather than his or her capabilities. Trieschmann (1988) stated:

> Have professionals, in clinical interactions, placed disabled persons in a *Catch 22* position? If you have a disability, you must have psychological problems; if you state that you have no psychological problems, then this is denial and that is a psychological problem. (p. 70)

; and (d) finally, Trieschmann concluded that longitudinal research seems to be the only appropriate way to follow such an adjustment process. However, the only longitudinal study in relation to this question (Dunn, 1969, cited in Trieschmann, 1988) found that patients demonstrated a striking variability in their adjustment to spinal cord injury. Therefore, a controversy appears to exist in the literature between the existence, usefulness, and validity of stage-based models of adaptation to physical injury. The ability of the present Risks Model to integrate both perspectives into its structure is discussed next.

The Risks Model as an Effective Compromise of Opposing Views?

In the light of the above comments, it is hoped that the Risks Model can accommodate both the stage and individual difference theories of adaptation to athletic injury. It is proposed that the stages of the Risks Model are supported by the data and by existing theoretical models. The generalized stages of the Risks Model can also accommodate idiosyncratic contexts which mediate an individual's reaction to an injury.

First, generic stages have emerged from the data and these appeared similar to stage-based models that have been described in relation to the adaptation to a variety of illnesses and injuries (both athletic and non-athletic), and even from 'diseases' such as alcoholism (see the next section on addictions). On the other hand, it also appears as if there is room for a great deal of individual difference in the way that one experiences each stage of this process. For example, although all

of the athletes described their experience of being injured as an emotional one, not all of them agreed on all of the emotions that were presented in the *experiencing and dealing with emotions* part of the model. Thus, the model appears to be able to accommodate individual differences in the injury process. This might be expected, given the number of variables that can interact to create the injury experience (e. g., personality differences, perceived severity and meaning of the injury, the time of the season, stage of the athlete's life and athletic career, other life priorities, role of sport in an individuals life, etc.). In the light of the variety of such variables, the expectancy of individuals to follow an identical path does seem to be a gross oversimplification.

Secondly, the Risks Model can accommodate individual contexts which might underlie the vacillation between different stages. O'Hara (1988) indicated six symptom clusters which characterized minor head injury. These were depression/paralysis, anger/blame, denial/defensiveness, somatization, regression/dependency, and psychotic disintegration. Although there seem to be some commonalities with other models of reaction to injury, O'Hara mentioned that a client might go from depression/"paralysis" to relief to anger/blame if they get a diagnosis that explains why they are feeling the way they are. Anger might then be directed at the medical profession for not having diagnosed them properly. The point here is that a person's feelings will be governed by the context at the time and not, perhaps, due to an underlying generic process. Since a context may be different for different people, it may be very difficult to describe the adaptation to injury in terms of a generic model, when the context is specifically determined by such factors as an individual's pre-morbid personality, actual or perceived severity of an injury, timing of the season, age and developmental stage of the athlete, meaning of the injury, motivation for doing the activity etc.

The results of the present study appear to support both contentions. The participants did show both idiosyncratic and common responses to injury. Although athletes may not have experienced the same events in their injury, the evidence of saturation within each category indicated the similarities in the experience. In addition, when they were shown the model (Figure 1), all of the participants said they could relate the phases of the model to their own experience. Idiosyncratic

patterns were noted, however, in the length of time they stayed in a certain phase, the different experiences within each phase, the amount of cycling back and forth between each phase, or indeed if an athlete did pass through all of the phases. Perhaps it is a positive measure of the generalizability of the model that it can accommodate such common and unique variances.

Summary

In summary, the psychosocial experience of injury is complex and appears to be congruent with models of adaptation to injury reported by other authors. The Risks Model which emerged from the participants' data involves a small number of predictable phases through which the participants passed and, also, allows for individual differences in the injury experience.

The Risks Model appears to meet Caplan and Schechter's (1987) criteria for a stage-based model. That is, it is a useful heuristic device. For example, athletes said that it described their experience well and, therefore, the model can be a useful heuristic tool for educating athletes about the experience of injury. Secondly, it can accommodate a large number of individual differences.

A second area of interest related to the results was the concept of exercise addiction. This concept may mediate an athlete's response to injury and is discussed next.

Addiction and the Need to Exercise: Relevance to Sport Injuries

All of the seven participants noted that they felt they were "addicted" to their sport. This was noted by direct reference (e. g., "I was hooked on racing") and by indirect reference (e. g., "When you start training you want to do more"). Therefore, it was decided to review literature on the concept of exercise addiction. First, how do the athletes' reports of being addicted relate to existing literature on addictive aspects of exercise. For example, what literature is there to support or refute the exercise addiction concept and what needs might be fulfilled by an addiction to exercise? Secondly, how do the findings in the present study relate to existing models of recovery from other addictions, such as alcoholism?

Sport as an Addiction

The injured participants all mentioned that sport was addictive for them. For example, many said that since sport was a large part of their lifestyles it became difficult for them to give it up, even when injured. To what extent is this idea reflected in the literature, and how might the concept of exercise addiction affect an athlete's response to injury? First, two types of exercise addiction (positive and negative) are defined. Secondly, evidence for and against the concept of exercise addiction is presented. Finally, the concept of athletes as having addictive personalities is discussed.

Defining Exercise Addiction

Exercise addiction has been defined in terms of a need for a certain lifestyle. This definition was discussed by the participants in the present study. Exercise addiction has also been differentiated into *positive* and *negative* addictions and evidence for such addictions emerged from the participants in the present study. For example, one participant explicitly stated that he was *negatively* addicted to exercise. This section explores definitions of exercise addiction, including *positive and negative addictions,* and some societal influences that might encourage the addiction.

What is an addiction? Crossman, Jamieson and Henderson (1987) described addiction as "based on the experience a person derives from some particular thing; on the person's need for that experience; and on the way in which this experience fits in with the rest of the person's life" (p. 29). Sachs (1981a) stated that the process of addiction "can certainly apply to participation in physical activity, including running, swimming, and playing tennis" (p. 232). Again this definition is congruent with participants' comments about the role of exercise in their lifestyles.

Exercise, in general, and running or jogging, in particular, have been characterized as addictive by some authors. Glasser (1976) proposed that regular exercise could become a positive addiction from which people gained health and psychological strength. On the other hand, writers such as Morgan (1979), proposed that running can turn into a negative force - a *negative addiction.*

Glasser (1976) has been credited as the first person to conceptualize running, yoga, and other healthy pastimes as a positive addiction, as opposed to negative addictions such as alcohol and drugs. Using questionnaire and interview data, Glasser (1976) noted that people could become addicted to lifestyle habits such as meditation, yoga, and running. Although people might experience classical signs of withdrawal if their habit was missed (e. g., guilt, fatigue, irritability, laziness, tension and self-doubt), Glasser found that these people also reported positive effects of such "addictions." These included: self-confidence, weight loss, increased well-being, less anger, more healthy lifestyles (e. g., stopping smoking), and increased mental strength. "Many people weak and strong can help themselves to be stronger, and an important path to strength may be positive addiction" (Glasser, 1976, p. 11).

In reading Glasser's (1976) description of runners and their experiences while running, or not being able to run, it is interesting to note the similarities between Glasser's runners and some of the participants in the present study. The following quotes were taken from addicted runners cited in Glasser's (1976) book. The relevant themes from the present study are shown in italics, "When I miss my workout I feel as though I have let myself down. My personal integrity suffers a blow. Guilt feelings mount continuously until I run again" (p. 107) (*Dealing with Emotions-guilt, and a changing sense of self*). "He tells himself, 'your shins could stand a day off, you really have been running hard the past few weeks'. However, this doesn't in any way relieve the pain of the missed workouts. It just buys a little time" (p. 107) (*bargaining*). "If I miss a day's run it's a disaster...fidgety anger at whatever caused me to miss the run, or whatever is handy, guilt...extraordinary depression, literally feeling that life is pointless" (p. 109) (*Dealing with Emotions-anger, depression, guilt, and Lessons Role of sport in life*). To Glasser's runners it seemed that an injury was one of the worst things that could happen to them. A three week lay-off from a sore tendon "was like facing the grave because I thought my running career might be over" (p. 110) (*Dealing with the Impact*).

It appears as if some of the participants have a great deal in common with positively addicted exercisers in terms of their emotional responses to injury and lay-offs, since some of the emotions

experienced by the injured participants (e. g., depression, anxiety and irritability) were similar to those reported by Glasser's runners.

In response to Glasser's (1976) idea, Morgan (1979) coined the term *negative addiction* to describe the behavior of the "hard core exercise addict [which] resembles that of other major addictions"(p. 57). In negative addictions, the usually positive force of exercise moves out of perspective and gradually and insidiously begins to take over a person's life. Morgan (1979) described eight case studies where the individuals described scenarios in which exercise (in this case running) had become an all-consuming passion, often in opposition to vocational, social, and marital priorities, and in defiance of medical advice to stop running even if they were in severe pain from some type of injury. Of particular relevance to the present study is how Morgan (1979) summarized this phenomenon with the following description: "the runner who appears in the physician's office on crutches or in a wheelchair as a result of the crippling effects of excessive running can be compared to the hard-core drug addict who overdoses" (p. 58).

In the present study, the athletes who continued to exercise, despite injury, can also be thought of as negatively addicted to exercise. One of the participants who continued to run, despite chronic knee pain, actually said that he was unquestionably negatively addicted to running in Morgan's terms. It appears as if this type of 'bargaining' behavior can also be explicitly or implicitly sanctioned by the medical profession. For example, I was given permission to participate in an eight mile run to test my ability to tolerate the distance despite the fact I had a "slipped disk." Other participants have told stories of "running through" the pain of injury with the help of prescribed medication (e. g., pain killers, and anti-inflammatories, or cortisone injections). It is a moot point whether such behavior represents responsible management of a problem (e. g., enhancing physical healing, or help in maintaining a person's emotional equilibrium by allowing them to exercise) or a method of ensuring that the injury is exacerbated and rehabilitation prolonged.

Such addictive, compulsive behaviors can also be sanctioned by society's values. For example, Yates, Leehey, and Schisslak (1983) described an article in the widely read magazine, *Sports*

Illustrated, which practically "deified" (p. 254) a U. S. Olympic marathon runner who had to be restrained from running more than 120 miles per week, who ran 105 miles per week on a stress fracture, and who "drove himself to heat prostration with a body temperature of 42.2 degrees C (108 degrees F). He was packed in ice and administered the last rites" (p. 254). Such reports can unwittingly reinforce such behavior in people (e. g., young children or adults) who use popular and elite athletes as role models. Yates et al. (1983) thus cautioned, "As physicians we do not create the cultural biases; on the other hand, we need not condone, covertly or overtly, self-destructive behavior " (p. 254).

Given that exercise addiction-type behaviors do exist, what evidence is there for or against its existence in the empirical research literature?

Evidence Supporting Exercise Addiction

The evidence supporting exercise addiction has been derived from studies using negative addiction scales, anecdotal evidence from female runners, and surveys of health behaviors in runners. However, there appears to be some controversy with respect to the definitions of exercise addiction.

What evidence is needed to support the notion of a negative addiction to exercise? Morgan (1979) stated that an individual must need exercise to cope with life, and feel that they cannot cope without running. If they are unable to run they will experience withdrawal symptoms such as depression, anxiety, restlessness, insomnia, fatigue, muscle tension and soreness, decreased appetite, constipation and bowel irregularity (p. 59). Morgan (1979) also stated that "the most convincing symptom is that the true exercise addict will continue to exercise even when it is medically, vocationally and socially contraindicated" (p. 59). This type of behavior was seen in many of the participants in this study. For example, one managed to run with the chronic pain in his knees despite medical advice that he would be a cripple.

Empirical evidence supporting Morgan's (1979) hypothesis has been reported by Hailey and Bailey (1983). In a study using the Negative Addiction Scale (NAS), which was developed from Morgan's conceptualization of negative addiction, these authors found evidence that addiction

scores were significantly higher in runners who had run longer than one year when compared to the scores of runners who had run less than one year. These data support a hypothesis that negative addiction to running may develop with time and agree with Glasser's (1976) contention that at least one year of running is needed before addiction to exercise can occur. However, problems with this study include an unvalidated or reliability tested scale, and an uncertainty as to what scores on the scale indicate true 'negative' addiction.

Other evidence for negative aspects of exercise addictions has also been cited by other authors. Sachs (1981a) listed withdrawal symptoms such as "anxiety, restlessness, guilt, irritability, tension, bloatedness, muscle twitching, and discomfort" (p. 233) as evidence of addiction, and cited a number of studies which noted these symptoms in male and female runners. Similarly, Harris (1986) cited results of one of her earlier studies of 156 women runners. Again, she found that the athletes indicated guilt, depression, tension, less energy, and feelings of fatness when they did not run. These appear to be indicators of a more insidious side of healthy behavior, and appear very congruent with participant's experience of the impact of their injuries.

Walsh (1985) also found evidence supporting exercise addiction which, in conjunction with the present study, has some disturbing implications for health professionals. For example, Walsh found that 35% of her sample of runners stated that they never cooled down after a run (which may predispose them to death from coronary factors) - this might be thought of as running the risks. Even more disturbing is that although 97% of her sample indicated at least one previous running-related injury, "only 18% said that they never ran with pain or while feeling ill" (p. 355). Thus over 80% of the runners had run while in pain or when ill. These data support the findings of the present study that athletes will run through a great deal of pain to continue with their sport or habit. Further evidence supporting a possible addiction to running was that over half of Walsh's (1985) sample of runners reported having feelings of anxiety, nervous energy, guilt, depression, and unhealthiness, and "42% said that they felt fat or bloated when unable to run" (p. 355). Perhaps the most interesting (or disturbing) aspect of Walsh's (1985) study was that her sample

was not of elite competitors, but was from "typical of runners across America in terms of variables [e. g., frequency and duration of training] for which verifiable normative data were available" (p. 355). Her sample, did however, compete more frequently than the normal runner, racing about five times a year.

Despite the popularization of the addictive terminology, a delineation of the exercise addiction process has been difficult to establish (Sachs, 1981a). In addition, the terminology of this area remains confusing. For example, Sachs (1981a) equated addiction with Carmack and Martens' (1979) notion of "commitment to running". Sachs (1981a) cited Peele's (1981) suggestion that the concept of positive addiction should not be termed addiction since this implies pathology. Instead, the term "healthy habits" might be applied to the positive addiction of running. The term negative addiction can still refer to more pathological aspects of running (i. e., exercising on serious injury).

Although there is some argument as to specific definitions of positive or negative addiction, commitment, obsession, or dedication to exercise, there is evidence supporting the general notion of "withdrawal" experiences as a result of exercise cessation. Therefore, if the participants in this study were truly addicted to their sports, as they said they were, some of the emotional impact of injury may have been due to such withdrawal symptoms. The concept of exercise addiction has not been without its critics, however. The evidence against exercise addiction is discussed next.

Evidence Against Exercise Addiction

The idea of exercise participation as addiction has not always found support. For example, evidence against exercise addiction has been shown in a study of exercise cessation in swimmers in which no withdrawal effects were noted. Other authors have suggested that the concept of exercise addiction is a confabulation of the media rather than a real phenomenon.

In their investigation of one and five day "lay-offs" from training, Crossman, et al. (1987) found no statistically significant evidence for unpleasant withdrawal effects from exercise in competitive swimmers and runners. In fact, although the men tended to show an addictive-withdrawal pattern,

women tended to show a pattern of relief (i. e., positive emotions resulting from the lay-off). This relief pattern was also found in the less elite athletes, with addiction-withdrawal characterizing more elite competitors. One theory to account for these findings is that the relief might be the result of a rest from overtraining. Crossman et al. (1987) did, however, note that the lay-offs were scheduled by the coach and this might have ameliorated the athlete's reaction (e. g., perhaps by perceiving the lay-off as legitimate and time-limited). These authors suggested that unplanned lay-offs (e. g., due to injury) might have a more negative effect. Similarly, Sachs (1981a) suggested that although withdrawal symptoms should be expected after a period of 24-36 hours without activity, these should only occur on days when the individual had planned to run.

Injury is an example of an unplanned cessation in activity which might result in withdrawal or deprivation-type responses. Perhaps a significant factor here is the *perceived control* that an athlete has on the length of the lay-off. For example, after an injury, uncertainty about the length of the lay-off and/or the perceived severity of the injury may result in greater feelings of anxiety and fear. The effect of perceived control as a mediating factor in the athlete's reaction to injury is an area for future research.

Steinberg and Sykes (1985) also critiqued the data on exercise addiction, which they said was "sparse and inconclusive, with inherent problems of suggestion, expectation, motivation and so forth" (p. 860). The role of suggestion was supported by Robbins and Joseph's (1982, cited in Sachs, 1981a) notion of the "Runner's World effect," referring to the extensive popularization of concepts such as "the runner's high" (the supposed narcotic-like experience of euphoria or heightened sense of well-being experienced by some runners (Sachs, 1981b)), and exercise addiction. Of relevance to the present study is the fact that such effects of suggestion might have led the participants to describe or believe themselves as being addicted even though they might not be.

Can Some Athletes Be Characterized as Addicts?

Given that participants in the present study said they were addicted to exercise and experienced sensations that can be thought as withdrawal symptoms, one might ask the

question, "Do athletes have similar personalities to other addicts such as alcoholics"? Answers to this question might also indicate why people exercise.

Several studies have investigated the personality profiles of exercisers in an attempt to see if habitual exercisers have addictive tendencies. Some studies have used scales of addiction to ascertain runners' addictive tendencies, while others have euphemistically labelled habitual exercisers as super-adherers.

Kagan and Squires (1985), for example, studied the relationship between scores on measures of addiction, compulsivity, hostility, need for approval, rigidity, and type-A behavior with the type and amount of exercise performed by 573 undergraduate and graduate students. In summary, the most significant findings were that the individuals who exercised most tended to reflect an addictive personality type, based on the MacAndrew scale for alcoholics. For example, males who exercised more than the average amount had scores equivalent to those found in alcoholics. The results supported the notion of exercise addiction and the theory that exercise might be used as a stress management mechanism, since people who exercised regularly were more likely to experience high levels of stress and tension (i. e., people denoted as Type-A's). Such results would help explain some of the impact of an injury, especially if exercise was used as a stress management method. For example, the emotional, cognitive and behavioral reactions to injury might reflect the symptoms of the stress that the exercise was meant to mask (see Sachs, 1981a) or the withdrawal from an addictive habit.

If exercise is an exclusive stress management mechanism (i. e., a mixture of stress management and addiction), this might have even further implications for the present study. For example, if an athlete has no other way of managing, coping, or dealing with the impact of the injury, how then can he or she cope with the stressor of injury? Various participants made mention of the fact that such alleviators of stress as support (e. g., family, friends, therapists and coaches), or having other facets of life to focus on (e. g., family, social, career or academic work) helped them cope with the injury. Thus, athletes who have few stress coping resources other than exercise might need additional help in getting through the trauma of injury.

One must always be careful of implying causality from correlational data, or using measures designed for application with populations different from those studied (e. g., the MacAndrews scale for alcoholics). Despite these reservations, Kagan and Squires (1985) were confident that their data "consistently indicated that 'addictive', rigid, hard-driving, compulsive, and ambitious individuals tended to exercise the most, usually in the form of running or jogging" (p. 235).

Contradictory evidence for this point of view was presented by Powers (1987). She investigated the addictive tendencies of both anorexics and obligate runners (i. e., runners who run regularly, run if ill or injured, and who experience withdrawal-like symptoms if unable to run on schedule). Again using the MacAndrews Addiction scale, she reported that neither the runners nor the anorexics scored in the clinically significant range. Again, Powers (1987) noted that this scale is for alcoholics and that the addiction process may be different for anorexics and runners. For example, she stated that both anorectics and runners have masochistic tendencies, whereas drug usage is usually considered pleasurable. However, one commonality of all these conditions is that they can be potentially self-destructive.

Rather than label habitual exercisers as exercise addicts, Clingman and Hilliard (1987) preferred to call their sample of competitive endurance athletes (runners, swimmers, cyclists and triathletes) super-adherers. These are "[p]eople who have already demonstrated their willingness to work to maintain fitness" (p. 124). The study by Clingman and Hilliard appears relevant to the understanding of the present investigation since a similar population was sampled (e. g., competitive athletes). Rather than focusing on the pathology of exercise (e. g., negative addiction), Clingman and Hilliard (1987) chose to investigate the scores of their 290 endurance athletes on selected scales from Jackson's (1984) Personality Research Form (PRF), a personality assessment instrument suitable for the normal population. The scales used were achievement (Ac), aggression (Ag), autonomy (Au), dominance (Do), endurance (En), harm avoidance (Ha), and play (Pl). Since the PRF is based on Murray's theory of needs (Anastasi, 1988), these personality traits should represent the needs of the athlete. Thus, sport might be conceptualized

as a method of need-fulfillment to which one might become addicted or which might be developed to the neglect of other means of satisfying these needs (or drives).

Clingman and Hilliard (1987) found that, compared to the average person, the overall super-adherer personality profile was characterized by higher need for achievement, perseverance, leadership, and harm-avoidance. Their finding that the super-adherer would object more than most, when restricted from doing things his or her own way, fits with the reports of frustration voiced participants in the present study. Their frustration, resulted from the injury's effect of obstructing their goals. This is especially relevant since the super-adherers scored lower in the play scale, indicating that they took their sport seriously. Participants in the present study were also serious, competitive athletes. It is also interesting to note that younger athletes scored lower on the harm avoidance scale, indicating that athletes might become more conservative with age. This pattern was certainly indicated by the comments of two of the present participants who indicated an decreased willingness to tolerate discomfort and more concern with the future health of their bodies as they became older.

Interestingly enough, although Clingman and Hilliard's (1987) results indicated some age and gender differences, there was a surprising level of similarity in the personality of men and women of all ages. This was also reflected in the similarity of responses to injury found between the male and female participants in the present study. Clingman and Hilliard's finding however, that younger females scored lower on the autonomy scale than their older female counterparts indicated possible changes in social norms. Since, nowadays, it is now more acceptable for females to exercise, perhaps females do not have to be as "nonconforming" as their older counterparts had to be in the past.

Thus, Clingman and Hilliard's (1987) study supports some of the findings in the present study. However, whether a "super-adherer" is the same as an exercise addict, or whether these two groups react differently to injury, is perhaps a topic for further investigation. One prediction is that both groups would react negatively to injury since it would interfere with a method of fulfilling a need. The notion of exercise as need fulfillment is discussed in the next section.

Exercise as Need Fulfillment

In this study, athletic injuries resulted in an impact on the lives of the participants, including frustrated goal attainment, the loss of positively reinforcing activity, weight gain, and emotional disturbances. Thus, this impact of an injury might result from the loss of sport or exercise as a method of fulfilling one's needs. Some recent literature lends some insight into this issue. Evidence for need fulfillment has been suggested by studies on the *athlete's neurosis* (Little, 1969), and the role of exercise in channelling emotional energy (Baekeland, 1970).

The Athlete's Neurosis

The participants in the present study reported a number of emotional difficulties as a result of being injured. Has this type of reaction to athletic injury been reported elsewhere, and why might it occur? Earlier studies have highlighted psychological problems related to being injured or deprived of exercise. Little (1969) described what he termed the *athlete's neurosis*. Little's study has already been reported in chapter two. To summarize, normal men who were athletically inclined, developed a neurotic-type reaction (e. g., anxiety and reactive depression) to minor illness or injury. Why did such seemingly normal men have such 'neurotic' reactions to illness or injury? Little (1969) suggested that it was the *meaning* of the injury to the individual that was the key. For people who hold physical health at a premium, an injury can result in a *deprivation neurosis*, which is "a bereavement reaction to loss of part of oneself" (p. 195), resulting from the "shock of a threat to overvalued, but waning physical prowess" (p. 195). The mean age of these athletic neurotics was 36 years. Little also cited Wallach's (1960) observation that athletes "are destroyed overnight by the concept of mortality...these fellows are always and forever twenty-one" (cited in Little, 1969, p. 195).

Morgan's (1979) case studies also illustrated feelings of omnipotence and invulnerability seen in negatively addicted exercisers. "At five miles or so into my daily run I developed a sense of invincibility - I was truly indestructible in that transcendent state" (p. 63). These findings support the reports of some of the participants in the present study, and some comments overheard during the data collection period, of an injury breaking through the myth of immortality. Injury can

literally become an athlete's *Achilles Heel*. As a result, the meaning of the injury will be different for each athlete depending on her/his need to feel indestructible and the meaning which being physically active holds for them. In sum, the *meaning of the injury* appears to be a key mediating factor in an athlete's reaction to her/his injury.

In addition to the athlete's neurosis, some authors have suggested that an athlete's reaction to an injury might reflect changes in that person's ability to direct their life energy.

Exercise as Catharsis: The Need to Redirect Energy

Little (1969) concluded that anyone who overvalued one area of their life at the expense of others could be predisposed to a 'neurotic' reaction if this area of their life is threatened. For example, one area of threat is the cessation of athletic activity by injury. One mechanism underlying this reaction might be an individual's inability to re-direct aggressive energy which is usually channelled or catharted through sport (Little, 1969). This emotional energy still has to be expended and such naturally occurring aggressive tendencies might be turned back on the self, leading to feelings of anxiety, depression, and guilt, unless it is channelled in other directions. Many participants in the present study mentioned the need to redirect the energy usually channelled into running.

Evidence supporting this "redirecting energy" hypothesis was found by Baekeland (1970), who investigated the effects of a month-long period of exercise deprivation on the sleep patterns of 14 regular exercisers. Interestingly enough, Baekeland (1970) admitted to the difficulty of getting suitable subjects for his experiment. For example, daily exercisers "asserted that they would not stop exercising for any amount of money" (p. 365). This fact might be seen as evidence of addiction, but also indicates that his results might have been affected by the level of athletic participation of the subjects.

In summary, Baekeland's (1970) results suggested that anxiety, as indicated by increased Rapid Eye Movement (REM) sleep density, increased as a result of exercise deprivation. Subjective reports of impaired home sleep patterns, increased sexual tension, and a need to be with others were also noted. Baekeland (1970) interpreted these changes in terms of the "drive

discharge model". Since exercise is an outlet for aggressive drives, an inability to exercise will lead to other libinal outlets for this energy, "whose gratification would reduce general levels of drive pressure" (p. 368).

As mentioned above, this mechanism might explain the restructuring of time (e. g., in school, social and work related activities), and re-investment in energy (e. g., in alternative athletic activities like swimming) that participants in the present study reported when they could not train due to an injury. As one participant put it, "You have to redirect all this energy." Further evidence of the need to redirect energy has been cited by Sachs (1981a) who asked the question, "What happens to the addicted runner who cannot run?" Sachs (1981a) suggested that "alternate activities" such as swimming or cycling should be used to replace a running habit, even though "this may not satisfy the "true" addict" (p. 243). Sachs (1981a) quoted one woman recovering from an Achilles tendon injury who said that substituting cycling for running "...was like methadone maintenance for a heroin addict" (p. 243). This person's responses were similar to the responses of participants in the current investigation, that is, replacement activities are often "not the same as the real thing."

Yates et al. (1983) also suggested that exercise, specifically fast running, is an "effective method of channelling and releasing anger" (p. 253). Their speculation was that if the exercise release mechanism was denied due to injury, unexpressed anger might lead to depression. Again this might be an explanation for the depression seen in injured athletes and is also support for my hypothesis that depression in athletes suffering from overuse injuries might result from unexpressed anger being directed at the source of the problem - themselves.

Therefore, exercise can be addictive since it is an important part of an athlete's lifestyle and can be an experience which fulfills certain needs within the individual, such as the channelling of aggressive drives or the development of an image of oneself as physically strong and, perhaps, invincible. If these needs are not met, then certain "withdrawal" symptoms might occur, such as depression or anxiety. In the present study, the participants reported very similar reactions to those described by Baekeland (1970), Little (1969), and Yates et al. (1983). This suggests that

thwarted need-fulfillment might be a mechanism underlying the emotional and adaptational responses that were considered to be part of "dealing with the impact" of injury.

Two mechanisms that have been suggested to underlie the addiction process, and the subsequent withdrawal-type reactions seen in addicted athletes, are explored further in the next section.

Mechanisms Underlying Exercise Addiction

Given that the reactions of the participants in the present study might reflect exercise addiction, what theoretical mechanisms might underlie their possible addiction? Two mechanisms have been suggested as underlying exercise addiction. The first is psychological in orientation, and involves the meaning of the activity in terms of need fulfillment to the individual while the second is a physiologically-based addiction to the endogenous opiates produced within the body as a result of exercise.

Psychologically Based Addiction

Psychological reasons for becoming addicted might involve exercise as a way of receiving positive reinforcement resulting from fulfilling achievement needs, managing stress, pursuing health, or maintaining an identity or self-esteem. In this latter regard, "addicted" runners have been compared to anorexics. This is discussed below.

Firstly, withdrawal symptoms might be experienced as a result of the loss of a method of managing stress, or of a valuable method of positive reinforcement (Robbins & Joseph, 1985). Robbins and Joseph (1982, cited in Sachs, 1981a) have also suggested that the return of the stress sensations found, once the masking effect of exercise was removed, might be misinterpreted as withdrawal and not for what it is, a reoccurrence of the previous problem. Thus, they suggested caution in interpreting the sensations and emotions felt with cessation of exercise as being withdrawal symptoms per se.

Secondly, for people who exercise habitually as a means of obtaining mastery, "frustration and irritability also appear to accompany withdrawal of a regular experience that acts to reinforce one's perception of competence and self-worth" (Robbins & Joseph, 1982, cited in Sachs, 1981a).

Although the participants did not explicitly describe exercise as a stress management mechanism, they did mention discomfort with their decreased performance capabilities due to their injury. Evidence for this were descriptions of feeling inadequate and having lowered self-esteem, or statements such as "I was a shell of my former self, I had lost my speed." Thus, the threat of losing a mechanism for obtaining personal mastery might underlie exercise addiction.

A third reason for exercising seems to be simply for health benefits such as weight control. For example, Riddle (1980) found that runners expected that running would yield positive health benefits and that runners valued these health benefits more than non-runners. However, the possible risks involved with this "pursuit of health" included possible addiction, injuries, and negative mental states when the habit was stopped. One participant illustrated this point when she noted that she was destroying her body, and her future well-being, in the pursuit of "optimal" health in the present.

Fourthly, some authors have also discussed the role of exercise in creating and maintaining an identity. In particular, Yates et al. (1983) noted the similarity of the behaviors of obligatory runners and anorexics as "a partially successful - albeit dangerous - attempt to establish an identity" (p. 251). Obligatory runners were defined as those who experienced depression and anxiety about physical deterioration if they could not run; they continued to run despite medical contraindications such as cardiac disease or stress fractures. They, therefore, appear similar to Morgan's (1979) negatively addicted runners.

According to Yates et. al. (1983), obligatory runners and anorexics share similar personality traits (e. g., introversion, tendency towards depression, discomfort with the direct expression of anger), feelings from being "high" (euphoric) (perhaps from endorphin release), family backgrounds, and high achievement needs. This latter point coincides with Clingman and Hilliard's (1987) findings of high achievement needs in super-adherers.

Thus, Yates et al. (1983) hypothesized that both obligatory running and anorexia are both processes aimed at the creation of self-identity that have gone out of control. Adolescent women focus on their bodies as the method by which they gauge their self-identity and they can control

this by strict dietary practices. Middle-aged men, the people Yates et al. (1983) identified as being most at risk, use the typically male ideal of physical effectiveness, especially at an age when physical and sexual prowess begins to decline. An obsession with health, fitness, and the expectation of a long healthy life is the result of this attempt to renew one's self identity, and perhaps curtail the aging process. Injury is, therefore, a major threat to people exercising for the aforementioned reasons, since they are haunted "by the fear that if one stops, one will cease to exist" (Yates et al., 1983). In the present study, the participants did not say they would cease to exist if they did not perform their sport, but they did note changes in self-esteem, and body-image (*Dealing with the Impact - changing sense of self).*

A further similarity between these two groups is that while anorexics deny the debility associated with their condition, obligatory runners also either deny their injuries or bargain with their health. The participants in the present study also denied their injuries and bargained in order to keep running.

Other authors (e. g., Blumenthal, O'Toole, & Chang, 1984; Blumenthal, Rose, & Chang, 1985) have disputed the analogy of anorexia and compulsive runners. For example, anorexics and runners did not share similar profiles on the Minnesota Multiphasic Personality Inventory (MMPI), since the anorexics demonstrated significantly more psychopathology than runners (Blumenthal et al, 1984). In addition, Blumenthal et al. (1984) criticized Yates et al. (1983) for failing to: report objective data, perform statistical analyses, and "distinguish a lifestyle from a distinct disease" (Blumenthal et al., 1984, p. 520). Blumenthal et al. (1984) concluded that "the similarities of runners and anorexic persons may be more of a metaphor than a valid assessment of their shared psychopathology" (p. 523). Clearly, more work needs to be done to clarify the processes underlying both anorexia and obligatory or compulsive running.

In summary, exercise might become psychologically "addictive" for a number of reasons including increased self-esteem, weight control, and stress management. For this reason, Blumenthal et al. (1985) suggested that regular exercise is a normal way to control and enhance health and should not be viewed as pathological. However, they do concede that addictive

running might occur if this method of enhancing health becomes an end in itself, and is considered the only way to achieve that end.

Another mechanism underlying exercise addiction involves a biochemical dependance on endogenous opiates which are produced during exercise. Although this aspect of the injury experience was not investigated in this study, the following brief review is included for theoretical completeness.

Exercise Addiction and the Endorphins

In the past there have been claims that the addiction to exercise might be mediated via the body's endogenous opiates (the endorphins, dynorphins, and enkephalins). However, such claims cannot be substantiated by the present literature.

Evidence for the endorphin theory has been derived from a combination of (a) anecdotal reports of runners becoming 'high' or euphoric as a result of running, (b) evidence of increased tolerance for pain after exercise, and (c) the notion of exercise addiction (Steinberg & Sykes, 1985). These three phenomena appear similar to the effects of narcotic opiates. Added to these data is the fact that endorphin and possibly enkephalin levels in blood plasma increase as a result of exercise and that endorphin receptors have been identified in the Central Nervous System (CNS) and skeletal muscle (Grossman & Sutton,1985). As a result, researchers have speculated that the body's endogenous opiates might be a mediating biochemical mechanism for exercise addiction. For example, as we exercise plasma endorphin levels increase. These levels are associated with pleasurable sensations (the high) and decreased pain. This positive reinforcement, coupled with a habituation to the endogenous opiates, stimulates a need for more exercise and so the addictive cycle begins.

Steinberg and Sykes (1985) cautioned against making far-reaching conclusions about this often cited connection between exercise addiction via the mechanism of the body's own endogenous opiates. They noted that the statements that exercise addiction to such opiate-like substances are based on "a stimulating...though till recently largely descriptive, anecdotal and scattered literature" (p. 859). After a review of the methodological problems involved in this

research, they concluded that "scientifically valid confirmation of the analogies (the effects of exercise and the opioids) is still relatively sparse" (p. 859). The area of opiates and exercise appears to need further research before any definite conclusions are made. Since no biochemical measures were obtained in this study, no connections between the participant's reactions to injury and endogenous opiate levels can be made.

Summary

In summary, an athlete's reaction to an injury may reflect a psychological addiction to exercise, based on the needs that the exercise fulfills. These needs might involve stress management, decelerating the aging process, developing self-worth through athletic achievements or a healthy body, and creating personal identity. An athletic injury can result in a psychological reaction related to the obstruction of this need-fulfillment. Such reactions were noted by the participants in the present study. Exercise addiction may also be mediated through biochemical pathways, although more data are needed to substantiate this mechanism.

If the impact of an injury results in symptoms similar to withdrawal from an addictive medium, how might the recovery from injury (the Risks Model) parallel recovery from an addition such as alcoholism? This issue is discussed next.

Comparing the Recovery from Injury and Alcoholism.

The following discussion will explore the question, "How might the experience of injured athletes relate to models of recovery from other addictions?". One model of the stages of recovery from alcoholism (Nace, 1987) appears very similar to the "risks" process described by injured athletes. Nace described four stages of recovery from alcoholism which appear to parallel those of the risk model. These stages are:

1. Recognition: In this phase the alcoholic recognizes that he or she has a problem. The information which prompts this admission might be internal cues, such as a health problem, or external cues (such as from the courts, employer, family, or friends). Nace (1987) suggested that a characteristic of this stage is a typical statement of "I am an alcoholic, but I'll deal with it myself"(p. 165). Thus, the severity of the diagnosis is often dealt with by denial or by "carefully guarded

reactive grandiosity" (p. 165). Nace's first phase appears similar to Phase Two of the Risks Model, *Acknowledging the Injury*, where there is a denial or misinterpretation of the messages given by the body or outside professionals. This denial is also related to the BPP, *opening to the messages*. The denial serves to protect the individual from facing the reality and severity of the problem and the need for external help.

2. Compliance: Nace's second phase involves "a going along without wholehearted acceptance" of the problem (Nace, 1987, p. 166). Here again, some cues tell the alcoholic that he or she has a problem (e. g., pain from some health problem). The alcoholic seems to react to this impact by seeking help, but as soon as the crisis subsides (e. g., pain resolves) the alcoholic thinks there is no need for further action.

This stage is reminiscent of the *Acknowledging the Injury* and *Dealing with the Impact* phases of the Risks Model where "bargaining" was a characteristic concept. For example, the athlete might decrease his or her workouts and seek treatment, but still race on the weekend, thus denying the seriousness of the problem and ameliorating the impact of the injury. Diminishment of pain is then a cue to increase the activity again and this might lead to a relapse into injury (*Ignoring the Lessons*), just like a relapse into drinking. Again, denial is a characteristic of this stage, as the individual moves back into relapse, or bargains with himself/herself, or the therapist.

3. Acceptance: With the onset of a specific event or crisis, or by repeated confrontations over his/her drinking, the alcoholic may eventually come to a full acceptance of his/her drinking problem. The person literally "admits defeat" (gives in). The former denial or defensiveness is given up, but could be reinstated at any time (relapse or *Ignoring the Lessons*). Treatment can really start at this point. The emotional impact of this realization might lead to depression (Nace, 1987). Similarly, in *Acknowledging the Injury*, participants reported either a sudden realization, or gradual dawning of the seriousness of their condition and the need to seek professional help. As the impact of the injury became apparent, the emotional reactions tended to become more severe.

4. Integration: In this final phase, Nace (1987) suggests that the alcoholic has completed the stages of withdrawal from alcohol. At this point the patient is stabilized and other personal issues can be addressed (e. g., exploring issues such as the need for alcohol, or the role of alcohol in a person's life). At this point the person is vulnerable to relapse (*Ignoring the Lessons*).

In the Risks Model, Nace's fourth phase seems congruent with parts of *Dealing with the Impact* (e. g., reorganizing lifestyle), and *Achieving a Psychological Outcome* (e. g., understanding the importance of sport or physical activity in one's life, and perhaps the need for alternatives). As a result of this integration, alcohol addicts may have to seek other ways of meeting their needs, for example, an alternative positive addiction (Brown, 1988; Glasser, 1976). Similarly, the participants needed alternative activities to replace their sport, either temporarily or permanently.

Thus, there appears to be a close similarity between the two processes of accepting and dealing with an athletic injury and another addiction - alcoholism. Both the processes of risking and opening to the messages appear relevant to recovering from alcoholism and athletic injury.

Summary of Exercise Addiction

Since all of the injured participants noted that they might be addicted to their sport, it was decided to review some of the literature on exercise addiction. It was hypothesized that injured athletes might be either positively or negatively addicted to exercise since all reported withdrawal-like symptoms after ceasing exercise due to injury. Many of the athletes also continued (or planned to continue) their exercise habit, despite medical advice to the contrary. It was noted that the Risks Model had some similarities to a model describing the recovery from alcoholism (another self-imposed risk), which was further evidence of the exercise addiction notion.

Evidence supporting the exercise addiction concept was reviewed and this evidence seems controversial. In the future, more controlled research is needed, particularly in discriminating between such terms as obligatory running, exercise compulsion, and exercise addictions.

Finally, exercise was discussed in terms of fulfilling the needs of the athlete. Exercise addiction might result from needs which need to be fulfilled, and the anxiety associated with the threat of

the removal of this need-fulfilling mechanism might underlie the denial and bargaining found in many injured athletes.

Since denial appears to be an important part of the *Running the Risks* process, this is discussed in more detail in the next section.

Denial as a Response to Injury

Denial has been proposed as a major factor in the response to both athletic and non-athletic injuries, and emerged as an important part of the Risks Model. For example, participants in this study discussed a delicate balance between hope, reality, and denial with respect to their injuries. However, how is denial defined and how prevalent is it in the health domain? What are the different types of denial? Does denial promote hope or result in an obstruction to therapy? These issues are explored in this final section.

Definitions and Prevalence of Denial

Denial has been defined as an ego-defense mechanism and as a common response to a number of different health conditions, including physical injury (e. g., Krueger, 1984). Many participants in this study noted that they denied their injuries until either the messages of the body or the medical profession helped them to realize the severity of their injuries. Although many people have discussed denial as a response to injury, it has been suggested that we do not understand the concept of denial as well as we might think. In this section different definitions of denial and its prevalence as a response to physical pathology are explored.

Denial has been defined as "a defense mechanism that simply disavows or denies thoughts, feelings, wishes, or needs that cause anxiety. The term is used for unconscious operations that function to "deny" that which cannot be dealt with consciously" (Reber, 1985, p. 186). This definition has been developed from Freudian concepts of ego-defense mechanisms suggesting denial is a potentially pathological process which wastes psychic energy (Ridley, 1989).

In relation to injury, denial has been defined as "the tendency to negate or downplay the long-term consequences of an injury because of their psychological implications" (Naugle, 1988, p. 218) and appears to be a common element in models describing the adjustment to the losses

associated with death and dying (e. g., Kubler-Ross, 1969), neurological impairment (see Naugle, 1988, p. 222), minor head injury O'Hara (1988), and alcoholism (Nace, 1987).

Caplan and Shechter (1987) reported that denial is observed as a response to a number of health problems including stroke, traumatic head injury, myocardial infarction, and spinal cord injury (SCI). Recently, denial has been hypothesized as an early stage in the reaction to athletic injury (e. g., Astle, 1986; Gordon, 1986; Pedersen, 1986; Rotella, 1984, 1988; Weiss & Troxel, 1986). In the present study, denial of an injury was a potential initial reaction of the participants (e. g., "I didn't think it was anything, so I ran through it", or "I hoped it would go away", and "I stuck my head in the sand").

Denial is, therefore, an important factor in a number of different health conditions. However, there seems to be a controversy in the literature as to what denial actually is, and how it is manifested. For instance, there seem to be different types of denial. In the next section the complexity of denial is described. Ridley (1989) stated that denial is:

> a complex phenomenon, and it is often inadequately understood in the rehabilitation setting....denial is frequently used as a diagnostic label, creating an illusion of understanding when in fact the real issues have not been examined in any depth (Ridley, 1989, p . 555).

Types of Denial

Before I embarked on this study, a senior physiotherapist in the Glen Sather Clinic asked me "How do we get through athlete's denial of their injury?" Since denial may have different manifestations, I was faced with categorizing the types of denial which were demonstrated by the participants in the present study. The correct identification of the type of denial has implications for its management.

Denial has been differentiated on the basis of etiology, the ways it is manifested in the individual or family, and the reasons for its invocation. Denial is an unconscious phenomenon. It cannot be seen and, thus, has to be recognized by a person's behavioral and verbal manifestations. Once these behaviors and verbalizations are analyzed in depth, it is generally agreed that the concept

of denial is more complex than first appears. For example, different types of denial can be differentiated, based on the etiology of the denial. Naugle (1988), Deaton (1986), and Cicerone (1989) have all cautioned the practitioner to discriminate between *organic* and *functional* denial. Organic denial (or anosognosia) arises from specific lesions in the cerebral cortex of the brain, and results in a "loss of self-monitoring capacity...or simply a lack of appreciation of deficits" (Deaton, 1986, p. 232). The latter, more psychologically based or functional denial, appears to be the type which is manifested in most health-related models of denial, such as the Risks Model.

Deaton (1986) cautioned practitioners to be aware of the different manifestations of psychologically-based, or functional denial which might be behavioral, verbalized, or cognitive since each type of denial might have different effects on therapy. For example, Fordyce (1983, cited in Deaton, 1986) described spinal-cord injury patients who, although they *verbally* denied the severity of their injuries, *behaved* adaptively in adhering to their treatment regimen. *Behavioral denial* might be exemplified by such things as refusing to participate in therapy (e. g., O'Hara, 1988), trying to walk on an phantom (amputated) limb, a lack of illness-focused anxiety (similar to *la belle indifference*), or the amount of time a patient allows to pass between symptom onset and seeking treatment. This last sign is particularly significant for the participants in the present study who often described this behavior pattern and has also been described in other athletes (e. g., Kent, 1982).

Examples of *verbal* denial might be the alcoholic's exhortations of "not having a problem", or the athlete saying "It's OK, I'll run through it". In relation to this latter manifestation of denial, Caplan and Shechter (1987) also distinguished between the *denial of fact* (e. g., "I do not have an injury") and the denial of the *implication* of the situation (e. g., "Just because have a crippling back injury it doesn't mean I won't be back for the play-offs!"). They stated that patients rarely deny their illnesses, but they do deny the *meanings* or implications of that illness. Denial of the implications or the severity of their injuries appeared to characterize the participants in the present study. Such a situation is exemplified by such statements as "I am injured, but it doesn't mean I have to stop training", and might also be re-conceptualized as bargaining.

Finally, *cognitive denial* might involve dreams or beliefs of being completely recovered when this is clearly not the case, for example, someone expecting an amputated limb to grow back. Examples of this type of denial were not explicitly stated by the participants in the present study. However, one participant said that his bargaining behavior was encouraged by the belief that his knees could be replaced by surgery in the future. This appears similar to a cognitive denial of the future impact of the injury since no surgical procedure can guarantee success!

Ridley (1989) discriminated between the reasons for denial. Coping with a stressor, such as an injury, might involve problem-focused coping (e. g., how to heal the injury) and emotion-focused coping (e. g. how do I make myself feel better?). Thus, denial which prevents problem-focused coping (e. g., statements such as, "I do not have an injury," or not attending therapy) may be dysfunctional, whereas emotionally-focused coping may be quite useful if the actions do not interfere with healing. Methods of emotionally focused coping include reframing (altering the personal meaning of the situation), making positive comparisons with others (e. g., "I'm not as badly off a them"), optimistic faith, or interpreting the event as part of an ongoing plan which minimizes the perceived threat (Ridley, 1989). It is interesting to note that all of these strategies were used by the participants in the present study to deal with emotional impact of their injuries.

It is my opinion that firstly, like resistance to psychotherapy, a client's *behavior* may often be a more significant indicator of denial than the client's verbalizations and, secondly, that bargaining-type behaviors indicate that the severity of the injury is beginning to enter an athlete's conscious awareness, such that some reparative steps are initiated. Thus, bargaining appears to be a less severe form of denial.

The foregoing is not intended to be an exhaustive review on the concept of denial. However, from the above literature, it appears as if denial is a more complex phenomenon than originally thought, and the application of the generic term, *denial*, should be done with caution. Perhaps more specific variants of the term should be used, depending on the situation. Therefore, an accurate assessment of the type of denial and the reasons for it would enhance the efficacy of

interventions. For example, it may be that some forms of denial are functional and not pathological. The two sides of denial in coping with injury are described below.

Two Sides of Denial in Injury -Hope and Obstruction

In the present study, participants noted that denial of the injury, manifested in behaviors such as not pursuing medical advice or continuing to exercise with an injury, may have exacerbated the participants' injuries. On the other hand, participants described bargaining and denial as a source of hope and motivation. For example, denial of the potential negative consequences of her knee injury ("I had no doubt that my leg would perform as good a new") helped one participant to cope with her emotions. This section explores these two sides of denial in more detail.

Denial can be a problem if it results in obstructions to rehabilitation and the acceptance of, and adaptation to, the implications of an injury. Cicerone (1989) observed that "ultimately, the importance of denial...may be the degree to which it interferes with treatment and subsequent functional status" (p. 107). For example, ceasing therapy prematurely may interfere with returning to work (or sport) due to the fear of assuming less complex duties (inadequacy) and, perhaps, lead to the development of risk-taking behaviors to prove competence (Deaton, 1986). This may have occurred in one participant, who engaged in risk-taking activities such as water-skiing despite an awareness that there was a chance of re-injuring her knee. This is an example of how denial can infiltrate the process of returning to physical activity.

Denial might be involved in other aspects of dealing with the impact. In terms of athletic injuries, Rotella (1985) and Gordon (1986), in their adaptations of Kubler-Ross's model of adjustment to loss, theorized that a period of denial can prevent the athlete from moving through to accepting the loss (injury) and dealing with it appropriately. Theoretically, one cannot mobilize one's resources to meet the challenges imposed by a stressor until one has accepted that the stressor exists. "Only after that denial diminishes is an optimal recovery from the injury possible" (Naugle, 1988, p. 222). This pattern was substantiated in the present study since many athletes misperceived the seriousness of the injury, or denied it altogether. This denial was manifested in behaviors such as running through symptoms that were perceived either as being minor, or

delaying in going to see the doctor. Participants conceded that both of these factors might have made the injury worse.

Emotionally-focused denial can be a useful way of dealing with the emotional impact of an injury or disability and of maintaining hope (e. g., Deaton, 1986; Krueger, 1984; Naugle, 1988). "Denial is one of the ways we get through hell," said S. P. Aadalen a quadriplegic (Aadalen & Strobel-Kahn, 1981, p. 1475). "In practice there is a thin line between denial and seeing the situation as a challenge instead of a threat, or between acceptance and giving up hope" (Ridley, 1989, p. 558).

How do denial and hope interact? Gunther (1971) suggested that initially hope comes from an expectation that the injury can be reversed or cured. In many cases (e. g., many less severe injuries like tendonitis or a fractured limb) this is true. For example, explicit examples which were provided by models who have recovered from injury and the implicit promises that modern medical science can fix virtually anything, can provide expectations of recovery from an injury. Examples of the use of models to provide hope were described by one participant in the present study. On the one hand she talked to a male player who had recovered fully from a similar knee injury. On the other hand, she was told by another female player that she would "never be the same again". Listening to the male player, and her faith in herself, helped her maintain hope during lengthy therapy. She is now playing again.

Hope based on realistic and highly probable outcomes, therefore, seems adaptive. Problems appear to arise in the adaptation to injury when unrealistic outcomes, such as the unrealistic belief of the reversibility of irreversible damage, such as spinal cord lesions or nerve damage, are expected and reinforced by significant others. The inaccurate interpretation of an injury can thus reinforce denial of the severity of the injury and may lead to inappropriate ways of dealing with the injury (e. g., not attending therapy).

However, given the uncertainty of the outcome of many injuries it is a moot point whether an injured person's expectations are realistic or not. In my own experience, one of the most difficult issues I have had to deal with was the uncertainty related to my back injury. The health professionals I visited were, for the most, part very reluctant to give me a timeline for the injury to

be healed. Messages like "It's a long, slow process" did not help me resolve my dilemma of "How long will this take?". I understood their inability to give me a straight answer and the dangers of them providing me with false hope by giving unrealistic timelines. However, living with such uncertainty, at times, resulted in periods of black despair and thoughts of "is this never going to end?". If I did not have the secret hope that one day I would be recovered and able to run again, I'm not sure what I would have felt like. I am still unsure as to whether my hope is based in fantasy or reality!

The question still remains, is denial a pathological process or a valiant struggle against the odds? For example, there seems to be a fine line between the realistic acceptance of an injury, and a determined resistance not to let it control your life. Ridley (1989) talked about the fact that some people who do not accept the limitations of their disability, and who attempt to lead as normal a life as possible have achieved remarkable feats. Examples from the sports domain include James Bell of the Edmonton Eskimos Football Team, who fought against possible permanent paralysis from a cervical spinal cord lesion and now is walking again. Similarly, a friend of mine, and talented sportsman until a back injury curtailed his rugby career, named Alisdair Houston, made local newspaper headlines when he dared to compete in the Cresta Run (a dangerous race down a bobsled course in Switzerland on a toboggan!) despite having broken his back twice ("It's cool courage", Kay, 1989). In a personal communication (April, 1990), Mr. Houston noted that one reason he performed this stunt was to defy the limitations that his injuries had imposed on him. It is difficult to say when such non-acceptance of the severity of one's injury is a brave attempt to regain control of one's life or a dangerous, foolhardy exercise which may result in permanent injury, and certainly cause anguish and anxiety in one's family. One crash and Ali might have been back in hospital for six months, or worse. This well illustrates the paradoxical relationship of hope and denial, and the fine line of "running the risks."

An example of the tragic consequences resulting from the denial of the severity of a physical condition was the story of Hank Gathers, an american collegiate basketball player and National Basketball Association (NBA) hopeful (Altman, 1990). Gathers had been diagnosed with a heart

rhythm disorder, yet continued to play basketball. Gathers controlled his heart condition by using the drug Propalonol. However, since Gathers complained that a side effect of the prescribed dose of the drug was sluggishness, which interfered with this athletic performance, the dose was apparently reduced. (This appears to be bargaining behavior). During a basketball game Gathers collapsed, and two hours later lay dead from cardiomyopathy. From the results of the autopsy, it appeared as if Gathers' doses of Propanolol were not at a level which could control his heart condition. It appears that Gathers denied the severity of his condition and reduced his life-sustaining medication. Thus, in the quest for fame, fortune, and sports performance, Gathers gambled with his own life - and lost.

A delicate balance between hope, reality, and denial were discussed by the participants in the present study. Messages of hope can be sent by the medical profession and these can be true or false (e. g., by the use of accurate or inaccurate diagnoses and goal setting). False hope or encouragement ("everything will be all right") can reinforce denial or even bargaining, and can originate from the patient's family (Naugle, 1988) or the medical profession. For example, one participant gained faith from doctors who gave him messages that "his knees were structurally sound." This gave him the encouragement to continue exercising despite the fact that he was making the pain in his knees worse. On the other hand, realistic advice, such as "you are going to end up in a wheelchair" also spurred the participant to exercise in opposition to the prognosis. It was the one doctor who represented a tertium, or middle-ground (Watzlawick, 1983), who appeared to help this athlete. By putting the responsibility on the participant to say when he had had enough, and by giving him an honest prognosis, the doctor helped this athlete to moderate his activity to a point where further damage to the injury could be minimized. At the time of the study, this athlete was in a bargaining, or chronic management situation. However, this state of bargaining was also assisted by the hope that "new knees" (knee replacement surgery) might be provided by modern medicine in the future.

It is, therefore, difficult to predict the response of a person to realistic advice. Some may accept it, some may deny it based upon their personality or mood at the time. Similarly, messages of

hope might be construed in different ways. Thus, a particular message may motivate one person to adhere to a treatment program, while another might say "oh it's not as bad as all that, I can still run without sustaining permanent damage."

In summary, the two sides of denial are the obstruction of the healing process and providing hope. The first type of denial might be termed problem-focused denial, where the denial affects solutions to the problem of injury. The latter type of denial is emotionally-focused denial, which can help in dealing with the emotional impact of injury. It was suggested that the term "denial" might be inappropriate given the uncertainty of the "reality" of an injury, and that there is a thin line between denying the consequences of an injury and not giving in to it. It appeared that participants in the present study utilized both types of denial, both to their benefit and their detriment.

As a final note, the interested reader is directed to the following publications for some guidelines as to how to recognize and deal with denial in clinical practice: Caplan and Shechter (1987), Cicerone (1989), Deaton (1986), Naugle (1988), and Ridley (1989).

Summary of Denial in Injury

Denial is a complex phenomena associated with the recovery process of a number of different injuries and health conditions. Denial is seen as a fundamental aspect of the process of recovering from an athletic injury. Traditionally denial has been viewed as an energy-wasting, dysfunctional, process, and its adaptive value has been ignored. Denial has been also been defined in several different ways and professionals should become aware of these different aspects of denial before attempting to confront this condition in their patients. Denial has both positive and negative aspects, including interfering with the healing process and maintaining hope for the future.

It was suggested by this author that bargaining and denial are both attempts to minimize the psychological impact of an injury. It appears as if more research needs to be done in this area, specifically with regard to different types of denial and their associated outcomes, the timing of

denial, and when to ignore denial or when to intervene. Some references were given for those interested in practical approaches for dealing with denial.

Summary of Chapter Six

In this chapter the results of the present study (the Risks Model) were compared with existing models of individuals' reactions to athletic and non-athletic injury. In addition, the results were discussed with respect to the concepts of exercise addiction and denial.

It was concluded that the Risks Model could be supported by existing models of psychosocial reactions to athletic and non-athletic injury. However, the present model appears more comprehensive than existing models such as Grieving and Loss, and Stress Response models which were previously proposed for adaptation to athletic injury.

The participants in the present study exhibited symptoms of exercise addiction. Evidence for this were statements of being addicted and indications of potential withdrawal symptoms, such as feeling irritable and depressed. Literature related to the concept of exercise addiction was reviewed, and the Risks Model was compared to a model of recovery from alcoholism. It was concluded that participants in the present study exhibited similar characteristics to those of exercise addicts and that the Risks Model shared similar features to Nace's (1987) model of recovery from alcoholism. Various mechanisms were hypothesized for these findings, including the needs that exercise fulfilled for the participants, such as creating or maintaining self-esteem and the pursuit of health benefits. In addition, biochemical hypotheses of exercise addition were briefly discussed.

Finally, since some participants denied their injuries, the concept of denial was discussed with respect to the findings. It was concluded that, although denial can obstruct the healing of an injury, it can also be a useful emotionally-focussed coping mechanism as long as it does not interfere with health behaviors, such as seeking medical attention for injuries. It was concluded that denial is a complex phenomenon which is not well understood at present and further research into this area is needed.

In the next chapter the conclusions of this research and implications for future research and practice are discussed.

Chapter Seven

CONCLUSIONS AND IMPLICATIONS

This study was initiated to contribute to the understanding of the psychosocial process of incurring and recovering from a moderate to severe athletic injury. This chapter contains a summary of the study, an examination of the researcher's presuppositions, contributions of the study, limitations of the study, future research topics, and implications of the results for professional practice.

Summary of the Study

The purpose of this study was to identify and describe the Basic Psychosocial Process(es) (BPPs) associated with moderate to severe athletic injuries. This process would then form the basis for a model.

Two Basic Psychosocial Processes (BPPs) emerged from this study, *Running the Risks* and *Opening to the Messages*. These two processes were the basis for four phases of a model describing the process. This model was termed the Risks Model, which is shown again in Figure 2.. Two additional codes were used to describe the process of relapsing and engaging in injury prevention activities.

The first phase of the Risks Model was *Getting Injured*. In this phase the participants incurred their injuries by internal factors, such as overuse or by external factors, such as contact with another player. *Running the Risks* was manifested in this phase by the athlete attempting to push beyond her/his capabilities or even engaging in the activity. *Opening to the Messages* was evidenced by <u>not</u> listening to the messages of over-fatigue or cues of an impending accident.

The second phase of the Risks Model was *Acknowledging the Injury*. In this phase the participants either denied or accepted their injury. Between these two extremes, the participants either bargained or partially accepted their injury. Participants *Ran the Risks* by ignoring or bargaining with their injuries and attempting to exercise on them. Sometimes they won and the injury cured itself. Sometimes they lost and the injury was exacerbated. Not listening to the

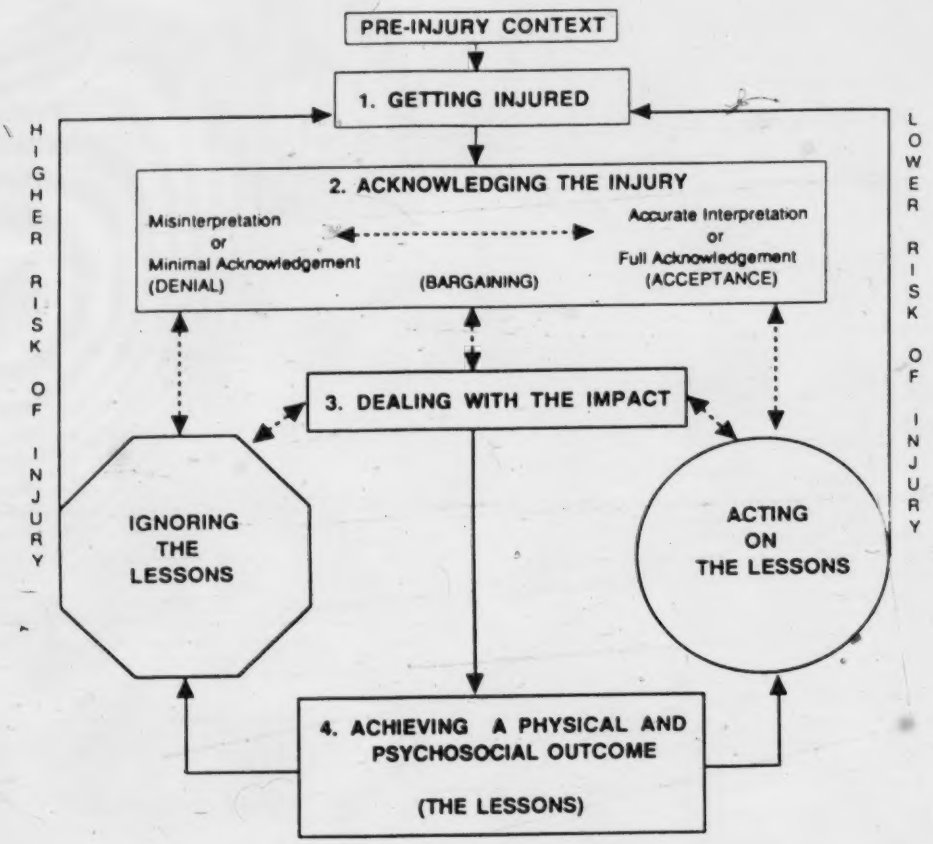

Figure 2. Running the Risks. A model of the psychosocial process associated with moderate to severe athletic injuries. Also referred to as *The Risks Model*.

messages of the body or health professionals helped deny the injury. *Opening to the Messages* helped acceptance.

The third phase of the Risks Model was *Dealing with the Impact* of the injury. The injuries had a significant impact on the participant's physical and emotional well-being and the participant's lifestyle, and this had to be adjusted to. In this phase the participants attempted to heal their bodies. They *Ran the Risks* if they bargained with their injuries or their therapists and attempted to return to their sport too quickly. *Opening to the Messages* was a fundamental process in listening to the messages of healing and guaging suitable levels of physical activity during recovery.

The fourth and final phase of the Risks Model was *Achieving a Physical and Psychological Outcome*. Physically, the participants partially (e. g., chronic injury management) or fully recovered from their injuries. Psychologically, they *Learned Lessons* from the injury, which included a changed perspective on life.

Two additional codes which appeared throughout the process were *Ignoring the Lessons* (relapsing) and *Acting on the Lessons* (engaging in injury prevention). Participants *Ran the Risks* if they forgot (or ignored) the lessons of injury prevention, such as warming up before exercise, or attempting to re-engage in activity too quickly. *Ignoring the Lessons* predisposed participants to re-injure themselves or incur further injuries. *Opening to the Messages* involved *acting on the Lessons* of the past, for example, listening to the body's messages of injury, getting early medical attention, or wearing protective clothing.

Examination of the Researcher's Presuppositions

Based upon my previous reading of the literature, and my own experience with athletic injury, some presuppositions were noted in chapter three. To what extent were these presuppositions supported or refuted by the data?

The first supposition was that recovering from an injury is both a mental and physical process. It was expected that this perspective would be seen in the data and the emerging theory. The results supported this notion. For example, both *Healing the Body* and *Experiencing and Dealing*

with Emotions were categories involved with *Dealing with the Impact*. Therefore, the data supported this supposition and behooves the health professional to be cognizant of the psychosocial aspects of physical injury.

Secondly, I did not totally agree with the Grieving and Loss models which were being applied to the area of athletic injury (e. g., Weiss & Troxell, 1986). For example, the losses from athletic injury may only be temporary as compared to losses, such as one's imminent death, or the death of a family member. In addition, the grieving models appear to be simplistic and do not seem to take into account the complexities of such phenomenon as adapting to athletic injuries. The data from the present study also supported this supposition. For example, although shock, denial, and depression occurred as a result of an injury, the injury response was more complicated than this. In addition, the grieving and loss models, when applied to athletic injury, did not explicitly address the concepts of relapse (e. g., *Ignoring the Lessons)* or the psychological outcomes of injury (such as *Acting on the Lessons)*. Neither did they discuss the fear and uncertainty often associated with injury, maybe because the loss of a loved one is permanent, but the outcome of an injury is unknown. Although useful heuristically, applying such theories from other substantive areas appears to have resulted in the illusion of understanding and oversimplification of the process of adapting to an injury.

My third presupposition involved my expectation that injured athletes would demonstrate denial of an injury, fear of weight gain, and negative emotional responses to injury such as uncertainty, frustration, and depression. I also expected that the reaction to injury would be idiosyncratic depending on the athlete's context. Again, all of these expectations were supported by the data. However, the finding that an athlete's perceived stage of athletic career development would affect his/her reaction to injury was not expected.

To summarize, all of the three major presuppositions were supported by the data. This begs the question, "Are the results a fabrication of my previously held biases?". In answer to this question, I believe that the validity checks made throughout the course of the research, and described in chapter three, attest to the credibility and validity or "truth value" of the findings.

Contributions of the Study

Before this project was conducted, there was a paucity of empirical research data on the psychosocial process(es) associated with athletic injury. The models that were previously proposed for this area had been adapted from other substantive areas such as grieving and loss, and an athlete's responses to stressors. These models were not developed from data derived from people's experience, but had been applied to the area based on various authors' personal or professional experience. To my knowledge, this present study is the first of its kind to specifically examine the psychosocial processes of athletic injury based on the experience of the athlete and, as such, is a significant contribution to this area.

The information gained from this study has supported much of the theoretical writing on the athlete's response to athletic injury and the psychosocial aspects of the process of rehabilitating such injuries. The present data have also highlighted the complexity of such an experience. This indicates that stage-based models, such as the five stage models of Grieving and Loss (e.g., Astle, 1986; Gordon, 1986; Pederson, 1986), can represent an oversimplification of this process.

I agree with Gordon (1986) that, although it is an idiosyncratic experience, the process of being injured does have some commonalities between individuals. For this reason, the Risks Model described a minimum number of stages which can accommodate both the similarities and the individual differences seen in the experience of recovering from an injury. However, the process of being injured may not follow a discrete number of stages, as suggested by the grieving and loss models, but may rather be cyclical as indicated by the Risks Model. The athlete's passage through the process may not be smooth and may involve cycling back and forth between phases, or even remaining in one phase for an indeterminate period of time.

To summarize, the present study has added to the data base in this area, particularly with respect to the complexity of the process. The limitations of this study are discussed next.

Limitations of the Study

Two factors may limit the generalizability of the research findings, these are the populations to which the "Risks" models is applicable, and the systemic scope of the model.

Firstly, it should be noted that the model was developed by interviewing participants who were not undergoing any psychiatric treatment, and who had legitimate physical injuries. As a result this model ,may not be applicable to individuals suffering from pathological psychiatric conditions such as psychogenic pain (American Psychiatric Association, 1987). In these patients the psychological issues involved with such conditions may not be adequately encompassed by a model derived from a so called "normal" population.

Secondly, due to the focus on individual athletes during data collection this model should be considered an individually-based model. As a result, the model may not adequately represent the involvement of other systems, and the individuals comprising them, such as the athlete's family, team, or even the medical system within which they are treated. The involvement of other macrosystemic contributors would be a topic for future research which is discussed next.

Future Research

Many future research projects are suggested. Four ideas for future research are:

1. The present study was limited to retrospective accounts of injury, although the author's ongoing experience with lower back injury was noted throughout the study. In the future, longitudinal research on the effects of injury, in particular the validity of the phases of the Risks Model, may be a useful exercise. For example, injured athletes might be followed through their process of rehabilitation. In addition, questionnaires or diaries based on the research results, may aid investigators to identify pertinent areas of study and increase the efficiency of data collection.
2. In this investigation injured athletes were the focus of research. The experiences of health care professionals (e. g., physicians, physiotherapists and psychologists) and coaches were only used for validation of the theory. In the future, information from such professionals could be a useful source of data for this area and this approach has already been implemented by Gordon

et al. (in press-a, in press-b). For example, the participants in the present study noted the importance of their relationship with their coach, physician, therapist, or trainer on their experience of injury. Therefore, future investigations might focus on these relationships, and the resulting effect on the athlete's passage through the process. An interesting aspect of this research might be the congruence (or lack of it) of each person's interpretation of the injury experience and the effect of this on the rehabilitation of the injury.

3. The generalizability of the Risks Model might be tested in the future by researching its application to the experience of other injured populations or health conditions. For example, other physically-injured populations such as wheelchair athletes, or people with work-related injuries, might also be investigated. More generally, is the process of recovering from, or dealing with, diseases such as cancer or cardiomyopathy similar to that of recovering from an athletic injury? Do similar concepts such as denial underlie the acceptance of diseases and physical injury?
4. Denial and bargaining were found to be common reactions to injury. However, a perusal of the literature indicated that the concept of denial is not well understood. Given that some health professional asked about how to deal with this concept, further research should be carried out in this area. For example, what types of denial are demonstrated by injured athletes? To what extent does denial interfere with rehabilitation? What types of interventions are appropriate with what types of denial, and when? To what extent is denial a problem for the therapist, rather than for the rehabilitation process?
5. A final research question is "Is there a parallel emotional concurrent model?". For example, could the "Risks" model be appropriate for emotional injuries such as depression following a bereavement?. Thus, would people with emotional pain go through a series of phases of incurring the psychological hurt, denying the emotional pain, accepting it, dealing with it, and finally reaching an outcome? Again, only future research directed at this question would provide the answer.

These suggestions are not exhaustive and only indicate the rich research potential of this area.

Implications for Professional Practice

The data gleaned from the present study also have some implications for the practice of health professionals such as psychologists, physiotherapists, and coaches. These include, (a) the education of coaches, health professionals, athletes, and family members as to the experience of injury; (b) the implementation of motivational strategies to encourage athletes and enhance program adherence; and (c) early identification of injured athletes requiring professional psychological attention.

First, the area of psychological aspects of sports injuries is new and the data from the present study could help to educate fellow professionals as to the nature and complexity of this process. Similarly, given the comments of the participants about the role of knowledge in coping with an injury, educational seminars, pamphlets, and self-help books aimed at athletes could facilitate injury prevention, recognition of the symptoms of injury, and early intervention. Being forewarned as to potential reactions to injury, and potential coping strategies, can help athletes deal with the impact of injury. Reading about the experience of other injured athletes may also help to normalize the experience and make it more understandable and controllable. Coaches may also benefit from educational interventions, specifically with regards to learning about the injury experience and how they can either facilitate or obstruct rehabilitation efforts. For example, becoming aware of subtle messages that are given which may be interpreted by the athlete as either encouraging them to get back too soon or to deny the injury. By being informed about the athlete's experience of injury, family members will also begin to understand the role they can play in supporting the athlete through those difficult times.

Secondly, the participants' comments about the factors enhancing motivation during therapy may be useful for rehabilitation professionals. For example, writing down a rehabilitation program with clearly understandable, specific, and measurable goals can help athletes adhere to their treatment program. Goal-setting sheets might help the implementation of such strategies. Frequent assessment and clearly communicated feedback as to one's progress appears to help athletes adhere to often monotonous and unrewarding rehabilitation schedules. In addition,

social support groups and role models demonstrating optimal recovery strategies can be a source of hope, support, and inspiration for injured athletes. Support and encouragement from therapists, trainers, coaches, family members, and teammates was also an important part of recovering from an athletic injury.

Third, all of athletes in this study were well-adjusted adults. However, all reported that, at times, they experienced significant emotional reactions as a result of their injuries. Although many athletes found positive ways to deal with this emotional impact, others said that they did not cope well with it. Early recognition of athletes having emotional difficulties by using paper and pencil instruments may identify injured athletes who may benefit from psychological interventions.

Implications for Myself as Researcher, Professional and Athlete

Finally, what implications has the experience of researching this study and coping with my own injury had for myself? Has anything positive come out of my injury? What lessons have I learned (or relearned) from the study? Some positive outcomes included an increased understanding of the phenomena, learning for professional practice, and for myself as an athlete.

First, my back injury gave me the opportunity to experience first hand what the participants were talking about. Rather than being a negative force in researching the present study, I felt that the bias was very positive. Undergoing the experience gave me a unique insight into the phenomena of being injured and provided me with insights that I felt I may not have gleaned from my participants.

Secondly, in terms of professional practice, undergoing the experience of lower back pain has increased my empathy for my clients undergoing this problem. In particular, I can relate to the anger, fear, depression, hopelessness, helplessness, and uncertainty that my clients have expressed in the past. I realize now that "advice" from healthy professionals can, at times, seem a little hollow. Phrases like "Keep your chin up" can only go so far in helping. However, having someone take the time to listen to what this injury means to me, inform me clearly as to what is going on, work with me to prepare therapeutic goals for the future, and to generate hope by

looking at positive, yet realistic outcomes, helped me "keep my chin up." Hopefully, working with people from this new perspective will help me provide a better service.

Thirdly, the main implication for myself, as an athlete, is to act on the lessons of the past, listen to my body, and learn to interpret the messages it sends to me. If I had done that in the first place, the chronicity of my lower back complaint may have been prevented. I am a good example of ignoring the lessons. Being active has been such a large part of my lifestyle (a reflection of my identity) for so many years, that it is difficult to accept disability no matter how temporary it may be. This has resulted in my running on seemingly minor injuries which then turned into major chronic conditions. My last severe injury was in 1984, and with the passage of time the lessons of the past easily fade from consciousness and are quickly replaced by the illusion of invulnerability ("I can do anything"). As I get older, it seems to take longer to recover from such injuries, and so it becomes even more critical to heed the lessons of the past. These include: reading your body; getting medical advice as soon as possible; learning what is temporary soreness and what might be a sign of more severe damage; and taking a day off once in a while - it won't kill you! You are not immortal. As you get older your body will tell you that - listen to it!

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APPENDIX A

DEMOGRAPHIC DATA FORM

University of Alberta
Department of Educational Psychology
and
Glen Sather Sport Medicine Clinic

Psychology and Sports Injury Research Project

DEMOGRAPHIC DATA SHEET

To be completed by participant.

Please complete blank spaces or circle the appropriate response.

1. **Gender (please circle one):** Male Female

2. **Height (cm. or ins.):**_____

3. **Weight (Kg. or Lbs.):**_____

4. **Occupation:**_____

5. **Marital Status (please circle one):** Married Single

6. **Highest level of education achieved:**
_____

7. **Do you have a coach? (please check one):** Yes No

8. **Type of physical activity involved in when you became injured (e. g., running, football, aerobics):**
_____
_____

9. **Sport classification (please check one):** Individual_ Team_

10. **Level of participation at time of injury (please check appropriately):**
__ International
__ Professional
__ Provincial
__ Recreational
__ School
__ Varsity
__ Other

11. What ambitions do you have relative to sports? Please briefly describe them.

_____
_____
_____
_____

12. Your status on the team (if applicable):

__Starter
__Captain
__Benchperson or reserve
__Other (please describe)

13. At the time you were injured or first noticed the injury, what did you suspect that the diagnosis would be? (e.g., sprain, strain, cartilage tear):

_____
_____
_____
_____
_____

14. Approximate hours of training per week

Now	**Hard Training** (if different)	**Off Season** (if different)	**Injured** (if different)
__3-5	__3-5	__3-5	__3-5
__5-10	__5-10	__5-10	__5-10
__10-15	__10-15	__10-15	__10-15
__15-20	__15-20	__15-20	__15-20
__20-25	__20-25	__20-25	__20-25
__Over 25	__Over 25	__Over 25	__Over 25

15. Please list your past injuries which have required therapy or have required a break from athletic participation for more than one week.

_____
_____
_____
_____

16. Members of immediate family (parents, siblings).

Name **Age** **Currently in Edmonton?(yes/no)**

_____
_____

Thank You
Jeremy Rose

APPENDIX B

INFORMED CONSENT FORM

University of Alberta
Department of Educational Psychology
and
Glen Sather Sports Medicine Clinic

Psychology and Sports Injury Research Project

INFORMED CONSENT FORM

Project Title: Investigating the psychological processes underlying the recovery from sport injuries.

Investigator: Jeremy M. C. Rose, M.A., C.Psych. (phone: 492-5245).

The purpose of this research project is to increase health professional's (e. g., psychologist, physician, physical therapist etc.) understanding of an athletic participant's experience of moderate to major athletic injuries (i. e., injuries that will prevent an individual from actively participating in their chosen physical activity for more than one week).

The research will be conducted via at least three interviews per person. Each interview will last approximately one hour. During these interviews you will be asked about your experience of athletic injury (e. g., your thoughts and feelings about being injured) and the recovery process. These interviews will be audio-taped and later transcribed. In order to protect your anonymity, the tapes and their associated transcripts will be assigned an identification number and stored in a locked filing cabinet. During either the second or the third interview, the information gained from your participation will be made available to you, so that you may comment on the accuracy of the investigator's interpretation of your data. Where appropriate, the investigator will have access to diagnostic information taken from your charts in the Glen Sather Sports Medicine Clinic (e. g., name, age, type and date of injury).

The final research report, including anonymous quotations, will be available to all participants, and will be presented as a Doctoral Dissertation.

Although there may be no direct benefits to participants in the study, the research findings from this study may eventually result in changes to patient care.

Sports Injury Research Project
Informed Consent (cont'd.)

This is to certify that I, _____ (print name)

Hereby agree to participate as a volunteer in the above named project.

I understand that there should be no health risks to me resulting from my participation in this research. The potential benefits of this research to me include increased self-knowledge (e. g., factors that might aid or prevent recovery). However, I recognize that there are potential risks involved when discussing personal issues (e.g., feelings of embarrassment, or discomfort when remembering the pain of the injury).

I hereby give permission to be interviewed, and for these interviews to be recorded on audio-tape. I understand that at the completion of the research (i. e., after the investigator's final oral defense of his dissertation), the tapes will be erased. I understand that the information may be published, but that my name will not be associated with the research.

I understand that I am free to refuse to answer questions during the interviews. I also understand that I am free to withdraw my consent and terminate my participation in this project at any time without penalty. I have been given the opportunity to ask whatever questions I desire, and they all have been answered to my satisfaction.

Signed.

_____ _____ _____

Participant Witness Researcher

_____

Date.

APPENDIX C

VALIDATION QUESTIONNAIRE AND RESULTS

Jeremy M. C. Rose, M. A., C. Psych., (AB),
Department of Educational Psychology,
6-102 Education North,
University of Alberta,
Edmonton, Alberta.
Tel: (403) 492-5245.

July/August, 1990.

Dear ,

Thank you for agreeing to be part of the validation process involved in my Doctoral Dissertation "The Psychosocial Process Associated With Athletic Injuries".

I am now at the stage where I am trying to validate my findings with people who were not involved with the initial phase of data collection. Therefore, I am asking two sport physiotherapists, two coaches, two athletes, two sport psychologists, and two physicians to give me feedback on the results based upon their experiences with the phenomenon of sports injuries. To do this I have enclosed (a) a consent form, (b) a diagram showing the process,)c) a summary of results incorporated with a questionnaire.

I would like to have your opinion of this process from the perspective of a,Coach, Athlete, Physiotherapist, Physician, Sport Psychologist.

I would greatly appreciate it if you could spend an hour of you time going through this package, complete the consent form, read the summary/questionnaire and answer those questions you feel you can, and return the questionnaire to me as soon as possible.

Thank you again for your interest in this project.

Yours,

Jeremy Rose.

Personal Data:

Please could you give me a brief description (i. e., less than 100 words) of your professional credentials (or athletic experience), and experience with sports injuries.

Professional Credentials:

Years of experience within your profession:

Amount of experience with sport injuries:

University of Alberta
Department of Educational Psychology
and
Glen Sather Sports Medicine Clinic

Psychology and Sports Injury Research Project

INFORMED CONSENT FORM

Project Title: Investigating the psychological processes underlying the recovery from sport injuries.

Investigator: Jeremy M. C. Rose, M. A., C. Psych. (phone: 492-5245).

The purpose of this research project is to increase health professional's (e. g., psychologist, physician, physiotherapist etc.), athlete's and coaches' understanding of an athletic participant's experience of moderate to major athletic injuries (i. e., musculoskeletal injuries requiring medical attention that will prevent an individual from actively participating in their chosen physical activity for more than one week).

At this point in time a number of competitive amateur and professional athletes have been interviewed twice in regards to their experience of sport injuries. A preliminary model of the phases associated with incurring, reacting to, and recovering from an athletic injury has been developed. Factors involved in the different phases of this process have also been described.

The validation portion of this research will be conducted via a questionnaire based upon a summary of results. The final research report, including anonymous quotations, will be available to all participants, and will be presented as a Doctoral Dissertation.

Although there may be no direct benefits to participants in the study, the research findings from this study may eventually result in changes to patient care.

Sports Injury Research Project
Informed Consent (cont'd.)

This is to certify that I, _____ (print name)

Hereby agree to participate as a volunteer in the above named project.

I understand that there should be no health risks to me resulting from my participation in this research. The potential benefits of this research to me include increased self-knowledge (e.g., factors that might aid or prevent recovery). However, I recognize that there are potential risks involved when discussing personal issues (e.g., feelings of embarrassment, or discomfort when remembering the pain of the injury).

I hereby give permission for verbatim quotations from my questionnaire answers to be included in the final research report and Doctoral dissertation. I understand that at the completion of the research (i. e., after the investigator's final oral defense of his dissertation), the questionnaires will be destroyed. I understand that the information may be published, but that my name will not be associated with the research.

I understand that I am free to refuse to answer questions on the questionnaire. I also understand that I am free to withdraw my consent and terminate my participation in this project at any time without penalty. I have been given the opportunity to ask whatever questions I desire, and they all have been answered to my satisfaction.

Signed.

_____ _____ _____

Participant Researcher Date.

Running The Risks: Or Opening to Healing?
The Psychosocial Process Associated With Moderate to Severe Athletic Injuries.

Validation Document

by

Jeremy Rose, M. A., C. Psych. (AB),

Department of Educational Psychology

University of Alberta

Edmonton

Running The Risks: Or Opening to Healing?

The Psychosocial Process Associated With Moderate to Severe Athletic Injuries.

In this project I have investigated the psychosocial (i. e., related to the individual's psychology, and with the people he or she interacts with) process associated with a moderate to severe athletic injury (e. g., an injury occurring to an athlete or habitual exerciser which requires a lay-off from training for at least a week, and requires medical attention). The data below has been derived from five athletes (two in-depth interviews each). As part of my research process, I am required to ask people who are involved in this area who were not part of the original sample to validate the model that has emerged from my interviews. Therefore, I would be most grateful if you could give your feedback on this process by checking the boxes of those aspects you agree with, commenting on those aspects you do not agree with, and adding additional comments or anecdotes from your own experience with injury.

Phases In The Process, And An Explanation Of The Process

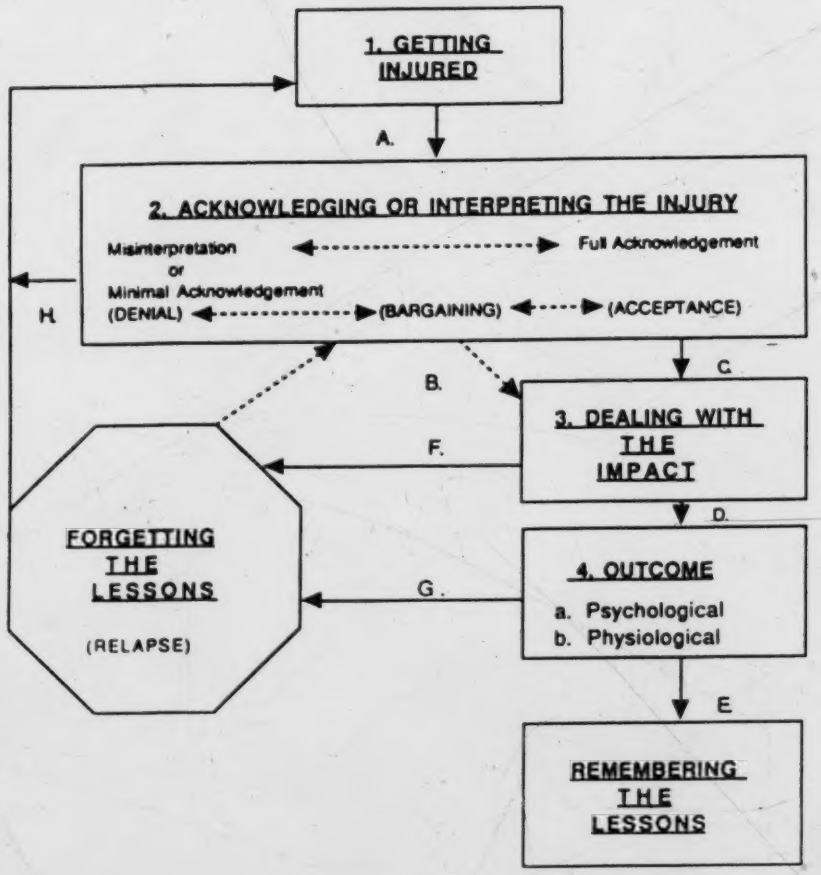
For a diagram of the process see Figure 1.

The four phases in the process are: 1. Getting injured, 2. Acknowledging the Message, 3. Dealing with the impact, 4. Outcome (Resolution and Reflection). Additional theoretical concepts include Forgetting the lessons (relapse), and Remembering the lessons (optimal injury prevention). A flow chart depicting possible pathways through the process is shown in Figure 5.1. Although the phases will be described in more detail below, the flow through the process is briefly described here.

An exerciser/athlete enters the process by Getting Injured (Phase 1). This can happen as a result of the overuse of a body part, an injury caused by a collision, an intentional aggressive act by another player, or simply by an accident. Thus, although the etiology of injury will vary all injured exercisers must pass through this phase. Shock or disbelief may or may not occur at this stage.

Figure 1.

Running the Risks: The Risks of Running
or
Opening to Healing



The injured person will then move into the second phase Acknowledging the Injury (indicated by arrow A). This phase appears to be characterized by a continuum between not acknowledging the severity of the injury (which has been termed Denial in the past- "It's not serious, I'll run through it"), partial acknowledgement of the injury (which might be conceptualized as Bargaining - "I am injured, I'll seek help, but only when it suits me, and on my terms"), and fully acknowledging the injury which might be termed as Acceptance- "I am injured and I need help now"). It is thought that full acceptance of the injury is needed before optimal rehabilitation and psychosocial adjustment can occur. The conditions of bargaining and acceptance allow the impact of the injury to be fully or partly acknowledged and this leads to the third phase of Dealing With The Impact (arrows B and C). In this phase the athlete has to adapt or adjust to the physical (e. g., the injury), cognitive (e. g., thoughts), behavioral (actions) and emotional results of the injury situation. Once the third phase has been passed through the athlete will typically move into the fourth phase, Outcome (arrow D). T he outcome of the injury might be thought of as both psychological (e. g., learning and changed perspective, renewed confidence) and physical (e. g., somewhere along a continuum of full recovery and return to the sport/activity, through partial recovery and engaging in the injury activity at a reduced level, or participation in a new activity, to not being involved in physical activity).

The concept of relapse has also been built into the model. This involves Forgetting The Lessons, or the learning that has occurred (if any) during the injury (e.g., the need to warm up, or cut down the volume of training), and thereby placing oneself at risk for re-injury (e.g., moving back into phase one). This may happen at any phase of the process (e.g., when dealing with the impact (arrow F); when back engaging in activity (arrow G); and when acknowledging the injury (arrows J and H).

The opposite of relapse has been conceptualized as Remembering the Lessons (arrow E). This concept involves engaging in and complying with health behaviors which should reduce the likelihood of further injury (e.g., following warm-up routines, stretching before a work-out, doing

preventative strength training, not waiting to seek medical advice, etc.). It is through this stage that exercisers and athletes can get out of the cycle.

Whilst it is recognized that "stage" models of adaptation to injury are controversial (see chapter five), the Risks Model is an attempt to encapsulate the common themes which emerged from the data, and yet allow the greatest possibility for individual differences.

Basic Social Processes Associated With This Model

A psychosocial process involves a change over time that occurs in a number of stages, and involves an interaction between an individual's psychological world and that of people in the social world around him or her. A Basic Psychosocial Process (BPP), is the core theoretical psychosocial process that underlies each phase of the model. In investigating this I had to ask myself "What is the bottom line psychologically as athletes experience athletic injury?". Two concepts became clear to me, they are: "Running the Risks", and "Opening to the messages". Please check the boxes below if this data matches your experience.

The Data Have Been Reported In Terms of Percentage (%) agreement with the data. Additional comments have been noted and stored in the audit trail.

Running the Risks: This appears in all the stages.

In the first phase athletes run the risk of injury just by engaging in physical activity.

100% agreement

In the second phase they run an even further risk if they do not pay attention to the messages of the body and deny the severity of the injury.

100% agreement

In the third phase risks might be taken in bargaining-type behaviors such as attempting to re-enter the sport too soon, or not completely adhering to a physiotherapist's rehabilitation plan by going Go-Kart racing on a spinal injury (this is akin to forgetting the lessons).

100% agreement

In the fourth phase 'running the risks' would involved forgetting the lessons (e.g., not taking appropriate precautions like wearing a cycling helmet in training).

100% agreement

Opening to the messages of the injury: This can be seen in:

Phase one if athletes ignore fatigue (remain closed to the messages) and thus predispose themselves to injury.

90% agreement

It can also be seen in phase two, where injured athletes can either deny, bargain or accept the messages the body is telling them (e.g., "Something is wrong get me fixed!").

80% agreement

Phase three involves a great deal of listening to the body during rehabilitation (e.g., when you can start exercising and how hard), not listening can lead to forgetting the lessons, and relapse.

(NOTE PROBLEM IN ANSWERING FORMAT) 60% agreement

In phase four forgetting or remembering these lessons can lead either to reinjury (by not cutting back on training, or doing preventative warm-up activities), or to injury prevention.

80% agreement

How do these two processes 'fit' with your experience of athletic injury?

Is there another "bottom line" that you have experienced with injured athletes?

The individual phases will now be explained in more detail.

Phase #1.- Getting Injured:

The psychosocial process associated with an injury begins with an initial chronic onset phase (i.e., overuse injury), or an acute incident such as an accidental or intentional collision with another player. The athlete may have some level of responsibility for the injury ranging from total responsibility (e.g., overtraining), some level of responsibility (e.g., getting injured in a 50/50 tackle), or no level of responsibility (e.g., chance). An additional variable also is a predisposing personality or physiology that encourages injury. Factors related to Getting Injured, are discussed below.

Factors Related To The Athlete's Responsibility.

The athlete's injury may derive from such internal factors as attempting to perform beyond one's capabilities (e.g., training too hard, and/or not allowing sufficient recovery time and being fatigued, ignoring fatigue), how one plays the game, and not engaging in sufficient preventative activity (e.g., stretching and warm-up).

Other Factors Related

Aggression from other Players: (e.g., accidental or deliberate fouls).

Medical History: (e.g., previous injuries and predispositions).

Chance: (e.g., just accidents).

What other variables, or examples of this phase come from your experience?

General agreement (70%) with additional comments. These can be seen in the audit trail.

Phase #2 - Acknowledging The Injury

Once the athlete gets an injury he or she appears to go through a second phase acknowledging the injury where he/she might move through a continuum between (a) immediately accepting the injury (Full Acknowledgement or Acceptance), (b) partially accepting the injury (sometimes referred to as Bargaining), or (c) not being aware or acknowledging the warning signs of injury and carrying on with the activity or delaying going in to see a health professional (often referred to as Denial). This latter phase of misinterpretation or denial might last a few seconds or many months or years.

Please check boxes if this matches your experience as an, or with an injured athlete. *There appeared to be some confusion as to how to answer these two questions.*

Fully Acknowledging the injury. (e.g., getting in for, and accepting, rehabilitation advice straight away. "I think I am injured and I need help!"). This process involves listening to...

80% agreement

Messages conveyed by the body (e.g., pain, joint instability, bruising)

70% agreement

Other Messengers of Injury: (e.g., health professionals, coaches, friends (e.g., "you are limping")

20% agreement.

Partially Accepting The Injury (Bargaining) (e.g., partially accepting rehabilitation advice, but continuing to run despite this advice. "I am injured, and I will take in some therapy, but I will run in this weekend's race anyway").

30% agreement

Not Acknowledging the Injury (denial). (e.g., ignoring the warning signs, or perhaps misinterpreting them - "It's OK, I'm not injured, it's only a niggling strain, it's nothing, I'll run through it").

20% agreement

The Duration of denial or bargaining. (may be seconds, weeks, or even years).

20% agreement

Variables Related To Acknowledging The Injury

Coming to an awareness or an acknowledgement of the severity of the injury, and passing through the phase of denial is affected by a number of different factors. These include:

Please check the box if these factors fit with your experience.

The athlete's beliefs about the severity of the injury, and the perceived outcomes of being injured (e.g. "It's nothing, it doesn't hurt after I've warmed up")).

90% agreement

The threatened loss of a fun (e.g., travel, functional activity (e.g. sport as a means of controlling one's life or weight), part of one's life ("sport is my life"), or even income (e.g., the professional athlete).

80% agreement

Hope whether true or false (e.g., medical professional telling you it's not too bad, or just personal hope that the injury would go away).

90% agreement

Decreased pain by symptom remission, or pain reducing strategies (e.g., by anti-inflammatories, game adrenalin).

80% agreement

Pre-existing personality traits and attitudes of athletes. (e.g., stubbornness and unwillingness to give up or to accept a negative diagnosis/prognosis, or feelings of invulnerability).

100% agreement

A feeling of being addicted to sport. (e.g., a feeling that one has to run, or play - dire consequences might occur otherwise - like weight gain, or statements like "I'm hooked on racing").

100% agreement

The type and actual severity of injury (e.g., tendonitis might encourage bargaining, but a catastrophic third-degree sprain would probably encourage immediate attention!).

80% agreement

How does this 'fit' with your experience? What other variables or examples are there from your own experience? Is there anything you disagree with? What (if any) self-statements characterize denial, bargaining and acceptance stages?

A variety of additional conditions, noted in audit trail

Phase #3 - Dealing With The Impact Of The Injury

Once an athlete or exercise participant accepts that he or she is moderately or severely injured the realization has a number of ramifications to the athlete or exercise participant depending on the meaning that the injury to him or her. An Australian cricketer illustrates the phenomenon of Impact.

"...Reality eventually set in however and I became very angry, disappointed and upset because I though I was going places, and so many people were expecting great things of me" (Gordon & Lindgren (in press) p. 5).

A. Experiencing Emotions.

The emotions associated with an injury are many and varied, and defense mechanisms like denial and bargaining seem to be undertaken to alleviate this emotional impact. These emotions derive from a number of different sources, these include:

Please check if these data match your experience.

Obstructed career, performance and lifestyle goals (e.g., not being able to go out and train).

90% agreement

Interacting with the medical system and medical interventions (e.g., the impact of surgery or a diagnosis).

80% agreement

The injury and its causes (e.g., anger at the person who tackled you).

60% agreement

Relating to self and others (e.g., feeling excluded from the team, or others telling you you are malingering).

80% agreement

Uncertainty of the future. (e.g., can I run again? To what extent can I get back?).

80% agreement

Any other sources of emotions from your own experience not included above? Any disagreements?

Several additional comments noted in audit trail

Commonly felt emotions included:

(Please check the boxes if you agree with these from your experience).

Anger (e.g., at the cause of injury)

70% agreement

Frustration (e.g., at not being able to train or compete)

90% agreement

Down/Depressed/Sad/Discouraged (e.g., with pain or little improvement in therapy)

90% agreement

Exclusion and Isolation (e.g., from a team or training group)

80% agreement

Fear: (e.g., of surgery)

60% agreement

Guilt (e.g., at losing fitness, missing rehabilitation)

50% agreement

Helplessness (e.g., at not being able to do much for oneself)

80% agreement

Inadequacy (e.g., not being able to keep up with others)

80% agreement

Jealousy (e.g., at others who can play when you can't)

60% agreement

Longing (e.g., "I wish I could run again)

80% agreement

Loss (e.g., feeling part of you (or your life) is missing)

90% agreement

Regret (e.g., at loss of sport career or play-off opportunity)

80% agreement

Relief (e.g., at a positive diagnosis, or having no pain on the first day out)

60% agreement

Shock and Disbelief (e.g., that one actually is injured)

60% agreement

Uncertainty (e.g., Will I be able to compete again?)

70% agreement

What other emotions are associated with injury from your experience? What causes them?

Several additional comments noted in audit trail

dealing with the emotions included:

Re-engaging in activity (e.g., feeling positive from getting back to the sport)

10% agreement

Faith (e.g., in God, oneself, or in one's rehabilitation program or physiotherapist)

70% agreement

Suppression, Burying or Repriorizing (e.g., not worrying about the injury, having other priorities to focus on)

50% agreement

Other Strategies.

Statements to self (self-talk): (e.g., stop feeling sorry for yourself, there's other's worse off than you)

60% agreement

Resignation (e.g., acknowledging the severity of the injury, and doing what has to be done)

90% agreement

Withdrawal and Avoidance (e.g., alienating oneself from the team to avoid the feelings that the team might elicit from you))

60% agreement

Receiving clear information (e.g., a clear diagnosis/prognosis helps reduce uncertainty)

90% agreement

Forgiveness (e.g., of the person that injured you).

50% agreement

What other 'dealing' strategies have you experienced?

A variety of comments noted in audit trail.

Re-organizing Lifestyle.

As a result of the injury people typically have to re-organize their lifestyle, either on the short or long term. This fulfills the function of redirecting the time and energy which is usually spent on sport. Aspects of this include

Increasing time spent at school or work.

90% agreement

Reorganizing lifestyle and career goals (e.g., having to move out of sport related work)

80% agreement

Changing physical activities, or activity levels (e.g., replacing the sport activity with something else (e.g., cycling for running), or cutting down the amount of activity).

90% agreement

Changing contact with friends and family (e.g., increased or decreased social life).

80% agreement

Any other examples from your experience?

A variety of comments noted in audit trail

C. Healing the Body

Various solutions are attempted to heal the body, and cope with the problems associated with it. These may or may not be successful. These included: seeking professional advice, experimenting (e.g., with various types of treatments, or professional opinions), protecting oneself (e.g., by physical means like knee braces, or behaviorally (e.g., avoiding hard tackles)), generating motivation to adhere to solutions, managing the pain, testing out and listening to the body and gradually re-engaging in the activity.

Attempting Solutions: includes: Self-treatment (e.g., rest, ice, or exercise), surgery, biofeedback, self-protection, exercises, 'alternative' medicine such as acupressure).

Maintaining and generating motivation and adherence to therapy.

Athletes often seem to have a problem generating and maintaining motivation and adherence to the program.

Some strategies and events that helped generate and maintain motivation included

(Please check if you agree)

Self-talk and reframing (i.e., looking at the situation from another perspective) (e.g., using the break as a chance to improve another sport (e.g., swimming for triathletes unable to run).

70% agreement

Improvements in function. (e.g., decreased pain, increased range of motion is motivating).

100% agreement

Social support. (e.g., encouragement from coach, family and friends).

90% agreement

Faith (in the rehabilitation program, or God).

90% agreement

The treatment environment. (e.g., being in a sports clinic with other athletes was motivating).

100% agreement

Taking responsibility (for the injury and adherence to treatment).

100% agreement

What other aspects of motivation relate to this from your own experience?

Variety of comments noted in audit trail

Managing the Pain

Pain is often a big issue with injury. Methods of pain management involved:

(Please check if you agree)

Rest and Ice.

100% agreement

Dissociation (e.g., mentally moving the pain out of the body as if it is not part of you).

80% agreement

Competition Adrenalin (e.g., being 'fired up' for the game helps you forget the pain).

90% agreement

Exercise.

90% agreement

Changing exercise technique (so it won't hurt).

80% agreement

Medication.

100% agreement

One problem with these techniques is that they can encourage bargaining type behaviors, and allow us to ignore the bodies warning signs and lead us to further re-injury.

Any other pain management strategies from your own experience?

Variety of comments noted in audit trail.

Returning to activity

A major part of rehabilitation is "testing out" the injury to gauge the level of function, and listen to the body to gauge whether one should cut back or go ahead with activity. This return is usually gradual (fired by fear of reinjury), but some may not restrain themselves and go back too soon.

How does this fit with your experience?

General agreement with a variety of comments noted in the audit trail

D. Changing Sense of Self

Another aspect of the injury involves the changes that a person sees within themselves. These might include:

(please check if you agree)

Conflicts of wanting to exercise and not being able to.

100% agreement

Losing trust in one's own body (e.g., doubt about one's future ability)

80% agreement

Changing sense of one's self-concept in terms of physical (e.g., body image- "I feel like a fat slob now I can't run")

80% agreement

Changing sense of personal self (e.g., self esteem "I feel bad about myself and the weight I put on")

80% agreement

Changing sense of performance ("I was a shell of my former self)

90% agreement

Changing sense of one's vulnerabilities

70% agreement

From your personal experience what other aspects of the 'Self' change due to injury?

A variety of comments noted in the audit trail.

Interacting With Others

The effects of the injury might effect how we interact with others in our lives (e.g., getting crabby or irritable). These changes may be positive (e.g., perhaps a saved marriage in the case of the running addict, or increased social activities) or negative changes, or negative (e.g., people thinking a person is malingering, people avoiding the athlete because they don't know what to say, or coach-athlete conflicts related to the injury).

What other examples are there from your own experience?

A variety of comments noted in the audit trail

Factors Affecting the saverity of the impact seem to include:

Please check if you agree

The athlete's coping resources (e.g., to deal with emotions)

100% agreement

The athlete's knowledge and previous experience with injury

100% agreement

Other priorities in the athletes life (e.g., family, career)

100% agreement

The level of social support (e.g., from family, friends, therapist)

90% agreement

The actual severity of the injury

80% agreement

The athlete's perception of the severity of the injury

90% agreement

The athlete's personality and maturity

100% agreement

The meaning of the injury to the athlete (e.g., the athlete's perception of the loss).

100% agreement

What other variables might effect the impact of an injury from your own experience?

A variety of answers noted in the audit trial

Phase #4 - Outcome, Resolution and Reflection

A. Resolution

At some point in time the participants reach some level of resolution to their injury. This might be on a point on a continuum between:

Please check if you agree.

No recovery (e.g., quadriplegia)

80% agreement

Partial Recovery (e.g., dealing with a chronic injury by reduced activity levels, changing activity)

100% agreement

Full Recovery (being able to go back to the sport with 100% strength, range of motion etc).

80% agreement

What other physical outcomes have you experienced?

A number of other outcomes noted in the audit trail.

B. Reflection back over the process and Learning

Although this reflection and learning might occur during the whole process, the data is presented here since it appears that as a result of the learning and reflection that injured athletes go through they become qualitatively different. The lessons that are learned are many and include learning about one's body and the injury, the messages of the injury, and gaining a new perspective.

Learning about one's body and the injury (e.g., one's own anatomy, and the signals of the body like the difference between discomfort and the pain of injury)

90% agreement

Our body's limitations and vulnerability. (e.g., as to what one can and cannot do with one's body).

70% agreement

The need for early intervention with injury. (as opposed to ignoring the pain or signals of injury).

90% agreement

The body's need for preventative strategies (e.g., greater flexibility, or warm-up periods, or decreasing training loads).

80% agreement

Other messages of the injury: (e.g., it is time to find another sport or stop running before you damage yourself permanently).

60% agreement

Gaining a new perspective and re-evaluating the role of activity.

(e.g., the importance of sport in one's life, the need for new lifestyle activities, or even re-motivation for the sport after a period of 'burnout').

80% agreement

Career or lifestyle perspectives.

The need to change careers (e.g., out of sport-performance related careers).

50% agreement

Of one's abilities when not injured: (e.g., of taking one's abilities for granted when not injured).

80% agreement

From your own experience what other learning or perspective changes result from injury?

A variety of comments noted in the audit trail

Ongoing Aspects Of The Process - Forgetting And Remembering The Lessons Learned

Again what is be an important part of the injury process is that of Forgetting and/or Remembering the Lessons Learned". Forgetting the lessons learned is related to the concept of relapse. Thus, athletes who attempt to run the risk and return to their activity too soon, or who do not interpret or ignore the messengers of injury (e.g., muscle soreness) can eventually move back into the injury process by "getting injured" again. Those who Remember the Lessons that they have learned (e.g., about preventative strategies such as stretching or acting on early signs of injury (acknowledging the injury) are more likely to get early intervention to the injury, or perhaps avoid injury altogether.

From your experience what might encourage people to either remember or forget the lessons of injury?

A variety of comments noted in audit trail.

Have I missed anything?

From your experience as an athlete/coach/sports physiotherapist or physician are there any things that I have missed in relation to this process?

If so please add any additional questions or comments below.

Again a variety of comments noted in the audit trail. In particular comments included the role of the coach in encouraging bargaining type behaviors and putting pressure on the athlete.

Thank you for your time and interest in this project.

Yours,

Jeremy Rose, M. A., C. Psych.